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DRAFT ENVIRONMENTAL IMPACT REPORT/ ENVIRONMENTAL IMPACT STATEMENT

for the

UPPER GUADALUPE RIVER FLOOD CONTROL PROJECT

VOLUME III
APPENDICES

Prepared by

SANTA CLARA VALLEY WATER DISTRICT
U.S. ARMY CORPS OF ENGINEERS

January 1997

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ARCHAEOLOGICAL RESOURCES EVALUATION

HISTORIC ARCHITECTURAL SURVEY REPORT FOR THE GUADALUPE FLOOD CONTROL PROJECT

FOR
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AUGUST 9, 1990

HISTORICAL ARCHITECTURAL SURVEY REPORT

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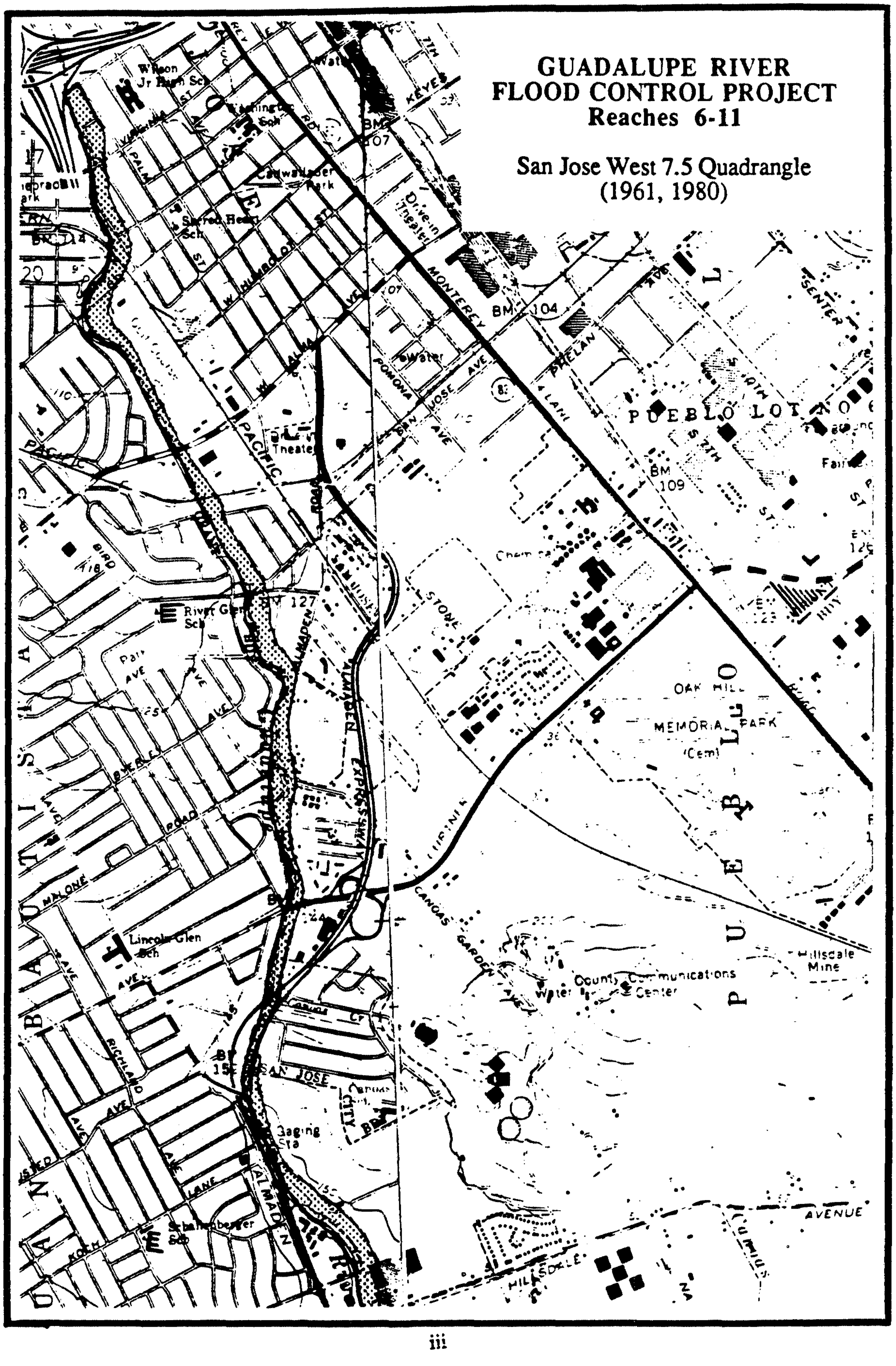
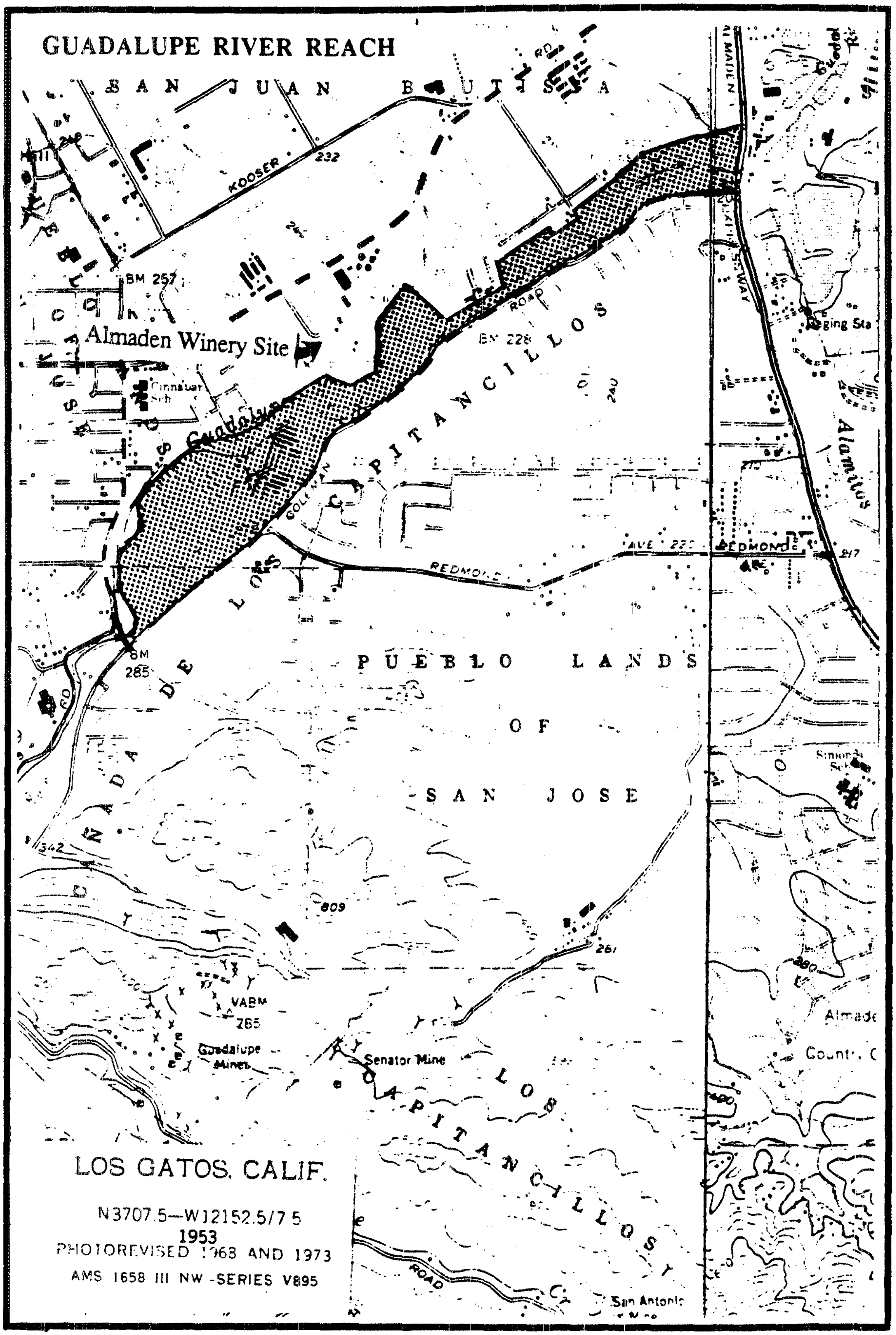


GUADALUPE RIVER FLOOD CONTROL PROJECT
Reaches 6-11

San Jose West 7.5 Quadrangle
(1961, 1980)

GUADALUPE RIVER REACH



HISTORICAL RESOURCES

HISTORICAL OVERVIEW

The hydrology of the Santa Clara Valley has been the key to the settlement and distribution of population from prehistoric times. This study focuses on the Guadalupe River and its relationship to the historical development in the area south of San Jose. The hydrological conditions that were first encountered by the early Hispanic and Anglo-American settlers in the area have been altered due to the modifications made to the river and its tributaries during the late nineteenth and twentieth centuries. These modifications are important in understanding the historical development along the river and the historical resources found within the project area.

The Guadalupe River and Canoas Creek have had major influences upon historical development within the project area. In its upper reaches, the Guadalupe is an embedded river that normally stays within its banks. Up until early American channelization activities, the Guadalupe regularly overflowed its banks in the Willow Glen area which created a fresh water marsh inhibiting early settlement. The Guadalupe River played a major role in the early development of the Santa Clara Valley attracting the Spanish explorers to its banks, and influencing the location of both Mission Santa Clara and the pueblo of San Jose.

Canoas Creek, originating in the Santa Teresa Hills, joined the Guadalupe River before channelization near Balbach Street in downtown San Jose. This stream also diffused into marshy areas at various locations along its course. Canoas Creek was important in the early water management strategies employed by the original Spanish settlers and the early Anglo-Americans that followed them. Early modifications of these two water courses provided water for domestic, agricultural, and industrial uses in the frontier settlement.

Early Development

During the Hispanic Period the study area extended from the southern boundary of the Pueblo of San Jose near the confluence of Canoas Creek and the Gaudalupe River, southward through pueblo's common lands and the San Juan Bautista Rancho. The pueblo of San Jose was established in November 1777. The colonist's first activity was to construct a dam and ditch (*acequia*) to provide water for irrigation and domestic use. The colonists received portions of land within the pueblo for their house (*solar*) and a parcel to raise their crops (*suerte*).

To further facilitate the colonization and development of California, the Spanish and Mexican governors were empowered to make land grants to qualified settlers. The Rancho San Juan Bautista was granted to Jose Augustin Narvaez in 1844, who had occupied the property since 1825. The primary economic activity during the Mexican period was cattle ranching for the hide and tallow trade with the United States and England. This growing traffic in commerce attracted American and European settlers to San Jose during the 1830s and 1840s.

Following the acquisition of California by the United States in 1846 and the influx of foreigners after the discovery of gold in 1848, the process of development was accelerated in the Santa Clara Valley. The pueblo was surveyed and laid out in a typical American grid system that facilitated the buying and selling of property and the large ranchoes were subdivided for the land-hungry farmers who were settling in the valley.

Flood Control and Irrigation Resources

The presence of a reliable source of water was a key influencing factor in the early settlement of the valley. During the Hispanic and early American periods the Guadalupe River was the source of domestic and agricultural water for the pueblo, ranches, and farms that were established on its banks. The location of buildings was a careful balance between the need to be near a source of water and far enough away from the river to be out of the flood zone (Laffey 1982).

The development of more intensive agricultural uses and the desire to more effectively utilize the lands within the flood zone for residential development led to efforts to modify and control flooding of Canoas Creek and the Guadalupe River. The transition from wheat production to more intensive types of agriculture took place early within the northern reaches of the project area. Since it was originally believed that fruit farming required considerable amounts of water, it was the easily irrigated tracks of land that were first planted in orchards.

The reclamation of the marshes in the Willow Glen area was initiated in the late 1860s. A canal was dug to divert water from the old shallow, frequently flooded channel of the Guadalupe River. This new channel was known as the Lewis Canal, having been dug by Frank Lewis, the son-in-law of James Reed, the owner of the land through which the canal passed. The reclamation of this marshy area made the very fertile soil available for orchards and the first strawberry cultivation in the valley. It is likely that the redwood features, recorded as CA-SCl-635H in Reach 10, were part of the early flood control and river channelization efforts that took place in Willow Glen during the 1860s and 1870s.

Residential Development

Reach 6

The residential development along the river banks has resulted in the most abundant of the historical resources within the subject area. Reach 6 is located in the area of San Jose known in the early years as the Fourth Ward, and more colloquially as Goosetown. The origin of the appellation of "Goosetown" is not known; however, the most prevalent theory is that it derived from the geese that inhabited the old *acequia* pond that was located between Grant and Virginia streets near the present Almaden Blvd. The pond was a remnant of the Pueblo Period water system that controlled and carried water into the Spanish pueblo for domestic and irrigation uses. This system was abandoned during the late 1850s; however, the pond remained in use as a mill pond through the 1860s (Laffey 1982). After the pond was reclaimed this area was subject to flooding due to the confluence of Canoas Creek with the Gaudalupe River and was marshy through the early 1900s. West Virginia Street was originally named Pond Street. Portions of this area were subdivided for residential development in the 1870s; however, the area west of Palm Avenue was not developed until the early decades of the twentieth century. Early occupation of Goosetown was by the Irish, followed by Germans. In the early 1900s, it attracted newly arrived Italian immigrants. Since World War II the area has become predominantly Chicano (Farrell 1983).

A large portion of Goosetown was known as Gulnac's Island. This triangular "island" was bordered on the west by the Gaudalupe River, on the southeast by the ditch that carried water from the Guadalupe to the *acequia* pond, and on the northeast by a mill race that carried water from the pond back to the Guadalupe. Flour milling activities began in this area in the late 1830s when William Gulnac and William Weeks built the first water-powered mill in San Jose. In 1848 William Fisher purchased an interest in Gulnac's Mill and gained possession of the southern half of the Island. Flour milling operations continued on Gulnac's Island until 1865.

Upon Fisher's death in 1850, his property south of Grant Street to W. Virginia Street remained undeveloped by his children, Fiacro Fisher and Mary Fisher Murphy, until after 1900. In 1903 Murphy's land south of Grant Street was part of the Emerald Isle Subdivision which extended east to Locust Street. This subdivision included Locust Street, Palm Street, Grant Street, and Killarney Place (now McLellan Avenue). Killarney Place was laid out along the east bank of the river coming to a dead end before reaching West Virginia Street. South of W. Virginia Street McLellan Street was opened along the river. When Killarney Place was later opened to W. Virginia Street, its name was changed to correspond to the southern portion of the street.

Fisher's property on the north side of Pond Street (now W. Virginia Street) and south to Edwards Avenue was subdivided in 1912 as part of the Conkling and Col Subdivision. This subdivision included West Virginia Street, McLellan Avenue, Harliss Avenue, and an extension of Palm Street. The area south of Edwards to Willow Street was subdivided in 1905 known as the Palm Tract (Recorded Map K:90).

Reach 7

The southern limits of the City of San Jose were located at Willow Street until the annexation of the City of Willow Glen in 1936. Reaches 7 through 10 are located in the historic area known initially as The Willows, later to become known as Willow Glen. Willow Glen was primarily an agricultural community until after the first World War when remarkable residential development took place. The community was incorporated as a city in 1927, enjoying its independent status until municipal practicalities led to its annexation by the City of San Jose. Most of the residential and commercial structures in Reaches 7 through 9 date from the period of development after World War II.

Development along Willow Street was given impetus during the 1880s by the extension of the San Jose & Santa Clara Horse Railroad (SJ & SC Co.) down Willow Street into Willow Glen. The horse drawn railroad cars were San Jose's earliest form of urban mass transit. In 1905, C. B. Wooster, an active real estate developer and secretary of the SJ & SC Company, acquired and subdivided the small portion of land on the north side of Willow Street within Reach 7 (Recorded Map L:6).

On the south side of Willow Street the orchards of J. Lelong and William McLellan were subdivided for the Willow Glen Tract. Blocks 3 and 4 of this tract were subdivided in 1887 and developed with small dwellings along Willow Street and Lelong Street. By 1950 the small residential structures on Block 4 (within the project boundaries) were being replaced by commercial and light industrial buildings. In the 1980 Block 3 became part of the Guadalupe Expressway. None of the 19th century homes that were once located in this area are extant.

Reach 8

As previously mentioned the Willow Glen area was very marshy until the reclamation of the area by the digging of the Lewis Canal sometime after 1866. James Frazier and Margaret Reed, survivors of the Donner Party and early settlers in San Jose, owned a large piece of the Willows traversed by the Guadalupe River. It is believed that James met Frank Lewis in the gold fields where he was involved in water channelization for mining purposes. Lewis married, Reed's daughter Martha in the 1850s and in the late 1860s built the

Lewis Canal through Reed's land, thereby reclaiming the marshes for agriculture and later residential development. The Canal is the channel of the Guadalupe River today.

Lewis died in 1876 and 40 acres of Lewis' property on the east side of the canal was acquired by Giovanna and Joseph Nicora. This parcel was subdivided for extended family members in the 1920s and the family maintained an orchard operation here until after World War II. About 1950 this area was included in River Glen Tract 710 which included Dawson and Mackey Avenues. The lots along Northern Road were included in the Heple & Moulton Tract #1 developed about this same time.

Reach 9

The northern portion of Reach 9 was also part of the Reed/Lewis property that was subdivided for small family orchards by 1890. This area was subdivided for residential development in the late 1940s as part of Willow Glen Villa Tract 141 and the southern end of Guadalupe Street was developed as the John Franklin Partition of the Willow Glen Villa Tract.

The tract of land south of Malone Road on the west bank of the Guadalupe was originally farmed by W. Hamilton. The 255 acre Hamilton Ranch was subdivided into fourteen 15 to 30 acre parcels in 1880 (Recorded Map A:35). Lot 13 was a 27 acre parcel located on the west bank of the Guadalupe south of Malone Road. This lot was purchased by Mrs. Rebecca S. Hensley, and she and her son, J. R. Hensley, subdivided the parcel in 1897. Mrs. Hensley retained 11.5 acres adjacent to the river on which she constructed a Shingle style late Victorian farmhouse (Recorded Map F1:10).

One of the earliest homesteads in Reach 9 was that of Thomas Kell who settled on pueblo land on the east bank of the Guadalupe near present Canoas Garden Avenue. His property extended as far north as Northern Road and south to approximately Old Hillsdale Road. Kell sold peripheral pieces of the property for small farms and orchards, retaining the major portion that was subdivided among his heirs. The parcel south of Northern Road was sold in 1863 to Edward Hill (Deeds Q:591 and U:539). This parcel was subsequently owned by J. Paine and Mr. Eitel (Recorded Maps F1:26 and I:105). In 1922 the property was subdivided for residential development as part of Herschbach's Subdivision of the Valley View Tract (Vault Map 2280).

Reach 11

The area south of Willow Glen remained in agricultural land until the post-1950 period. Larger tracts of land were continually subdivided for more intensive land use and small family orchards sprung up covering the valley floor. The land north of Branham Lane on the west side of the Guadalupe River was owned by Thomas Gault in 1876 and had been acquired by John W. Henderson by 1890 (Thompson & West 1876; Herrmann 1890). In the 1890s Henderson subdivided his 141.75 acres into 13 lots. Lot 13 was 13.32 acres located in the narrow strip of land between Almaden Road and the Guadalupe River (Recorded Map H:113). The southern tip of this lot was developed for commercial use as part of the Robertsville, a turn-of-the-century crossroad community that sprang up at the Almaden Road and Branham Lane intersection. The balance of the lot was subdivided in 1967 for residential use (Recorded Map 221:10).

Industrial Development

Early industrial activities in the valley were primarily associated with the valley's phenomenal agricultural production. The first experiment in commercially marketing dried fruit was successful in 1867 when dried prunes were sold in San Francisco by John Quincy Adams Ballou. In 1868, Ballou shipped eleven tons of dried fruit around the Horn to New York. The high prices realized from dried fruit led to the formation of the Alden Fruit and Vegetable Preserving Company by Willow Glen orchardists in 1874. This company was the first of many such operations that were scattered across the valley floor.

The tract of land south of the Kell Ranch on the east bank of the Guadalupe River was John Q. Pearl's 600 acre dairy ranch during the 1870s. Pearl subdivided peripheral portions of the ranch along the Guadalupe River prior to 1890 and then subdivided the remaining 400 acres in 1899. Most of these smaller parcels became prune orchards.

Valley View Packing Company

The parcel on the north side of Hillsdale Road (then Pearl Avenue) in Reach 10 was acquired by J. L. Mosher. Hillsdale was declared a public county road in 1899 and Mosher may have operated the Five Mile House saloon that was located where Hillsdale crosses the river. This saloon was one of five such establishments located at the rural Almaden/Hillsdale crossroads. Mosher also established a small fruit packing operation on Hillsdale Avenue. In 1916 Pietro Rubino purchased 18 acres from Mosher. This small orchard became the nucleus from which the Rubino family developed the extensive Valley View Packing Company.

Pietro Rubino was a Sicilian immigrant who settled south of San Jose in 1896. Pietro and his three sons farmed prunes as well as doing spraying, pruning, tractor work, and sharecropping on local ranches. The Rubino brothers first tried hand-packing prunes in the 1930s and by 1935 has developed a more efficient process for dehydrating prunes. They helped develop the first two-story box or above ground tunnel that dried prunes with a uniform flow of heated air. This system was the forerunner of the tunnels used today for the dehydration of prunes (Payne 1987).

In 1936 the brothers personally delivered their product up and down California from store to store and in 1938 began shipping dried prunes overseas. During World War II, with the growing government demand for dried prunes for the troops, the Rubinos purchased Mosher's small packinghouse to enlarge their operation which now encompasses 35 acres, of which 8 acres are a warehouse, refrigerated storage areas, and processing equipment under one roof (Valley View n.d.). The government need for prunes diminished with the end of the war and new markets and methods had to be developed (Payne 1987).

In the late 1940s and 1950s the Rubinos began processing cut and dried peaches, pears, and apricots. In addition, a process for making prune concentrate was perfected which enabled the Rubinos to manufacture prune juice and concentrate. In the early 1970s when a cannery strike left them without a market for orchards of cling peaches, the Rubinos began refining a process for the manufacture of fresh-fruit concentrate (Payne 1987). Valley View now ships fresh fruit puree concentrate in 55-gallon drums throughout the United States and South American (Valley View n.d.).

With the growth of sales came the need for a dependable source of fresh fruit. The orcharding operations grew to a statewide operation of approximately 3500 acres of apricots, prunes, peaches, pears and apples from Fairfield, Yuba City, Los Banos, Santa Cruz areas. Fruit from these orchards is processed and dehydrated locally and then shipped to the Hillsdale plant for packaging (Payne 1987).

What started as a small family orchard has developed into statewide operation that processes close to 20,000 tons of fruit per year. Once one of many such operations in the Santa Clara Valley, it is now one of the last remaining examples of this historic valley industry.

Almaden Winery

Between 1849 and 1852, Santa Clara County attracted between 1,000 to 1,500 French settlers, who immediately realized the potential of the valley and foothills for an important wine district. In 1851 Etienne Thée planted a vineyard on the north bank of Guadalupe Creek with cuttings from Mission grapes. He was soon joined by his countryman, Charles Lefranc, who married Thée's daughter, Marie Adele, in 1857. Within a year of their marriage, Lefranc became half-owner of his father-in-law's vineyards and established began producing wine from the mission grapes. Not satisfied with this wine, he imported vine cuttings from France which he grafted to onto the mission roots. Lefranc named his vineyard the New Almaden Vineyard and by 1862 had 40,000 vines and a winery in full production.

In 1878 Paul Masson, a young Frenchman, came to San Jose and began working for Lefranc in 1880. Lefranc died in 1887, and soon after, Masson married Lefranc's daughter, Louise. Masson and Louise's brother, Henry, entered into a partnership. Masson successfully produced champagnes, and incorporated the Paul Masson Champagne Company in Saratoga in 1898. When Henry Lefranc and his wife were killed in an automobile accident in 1909, the New Almaden Winery was inherited by their daughter and her two aunts. Masson became the winery's supervisor while continuing to operate his successful champagne business. In 1930 Masson traded the New Almaden Winery and vineyards for property in Gilroy and the new owners sold the property to Charles M. Jones. Upon Jones' death in 1941, the winery passed to Louis Benoist and Barton Wilbur. During the 1950s and 1960s Almaden grew into one of the best-known wineries in the United States. Benoist sold the winery in 1967 to National Distillers, and by 1980 Almaden was the third largest winery in the United States and was ranked as the nation's number one premium winery (Payne 1987).

The Almaden Winery site is a designated California Registered Landmark No. 505 and is listed on the National Register of Historic Places in recognition of the premium winemaking industry established by Charles Lefranc in the 1850s. Lefranc is considered the "Father of Commercial Winemaking in the Santa Clara Valley" (Bamburg 1989). The winery property is presently being rezoned from industrial to A (Planned Development) to allow for residential units. This zoning will protect remaining historic structures and heritage trees on the property.

Bridges

As this part of the valley developed transportation routes increased in importance. The major transportation route in the early American period was Almaden Road that extended from the New Almaden Quicksilver Mines to San Jose, closely following the course of the Guadalupe River. As the area developed, several roads were built that intersected this main transportation artery. When the river was at a low stage it was easily forded; however, bridges were built to span the river at key points. With the expansion of the railway transportation, tracks and trestles were built in the Willow Glen area in the early 20th century.

EVALUATION OF HISTORIC RESOURCES

The research for the evaluation of historic resources within the project alignment according to the criteria of the National Register of Historic Places was conducted during the months of March through May 1990. Resource types consisted of residential structures, industrial buildings, heritage trees, bridges, and flood control features. Archival research was conducted on the historical development of the area and the specific history of each structure or feature. Each of the resources were examined and photographed, and an historical inventory form (DPR 523) was completed. Inventory forms are located in the appendix.

The criteria for eligibility for the National Register of Historic Places were used in this evaluation. To meet National Register standards, a property must 1) be at least fifty years old, 2) meet one or more of four criteria, 3) possess architectural integrity, and 4) be evaluated within the context of the area's local history. Criteria for eligibility include: a) association with events significant to broad patterns of history; b) association with significant personalities in our past; c) have distinctive architectural characteristics of type, period, or method of construction; or d) have yielded or are likely to yield important archaeological information on the history of the area.

Reach 6

There were 53 structures evaluated for potential historical or architectural significance in Reach 6. These structures are part of three residential subdivisions: Emerald Isle developed after 1903, Conkling &Col subdivided in 1912, and the Palm Tract developed after 1905. Many of the structures within the Flood Control right-of-way date to the Emerald Isle's early development. Architecturally these houses are represented primarily by Neoclassical and Colonial Revival cottages or simplified vernacular versions of these styles. Examples include 334 Grant; 677, 689, 693, and 697 Palm; and 772 McLellan Avenue. Two structures on McLellan Avenue appear to pre-date the subdivision. 770 McLellan is a gabled vernacular structure with Queen Anne details that may date to the late 1890s, but does not appear in the records at this address until after 1910. 774 McLellan Avenue is an Italianate style that probably dates to the 1870s or 1880s. These structures may have been rural farmhouses located in this area at the time of development, or a more likely explanation is that they were moved onto the lot from elsewhere in the City. Structure relocation was a common practice during the late 19th and early 20th centuries.

Another architectural style represented in the Emerald Isle neighborhood is a California bungalow at 768 McLellan which was constructed in 1918. The balance of the residences in the subdivision were constructed during the 1930s through the 1960s.

The architectural style of structures within the Conkling &Col subdivision indicate that the fluorescence of development was during the 1930s and 40s. Several residences, however, date to the 1912-1920 period, and one structure pre-dates the subdivision of the property. The oldest house is 878 McLellan Avenue and appears to date to 1890-1900. A structure at this address does not appear in the records until the 1950s when the house was probably moved onto the lot. Other vernacular structures include 926 and 940 McLellan. There are three Colonial Revival structures within the right-of-way: 707 and 717 Palm, and 832 McLellan.

Four structures in Reach 6 have a marginal level of significance based on age or condition and state of preservation. 334 Grant Street is a well-preserved example of a Neo-classical bungalow constructed in 1910. 694 Palm is a simple vernacular structure with a hipped roof that dates to about 1910. 717 Palm is a good example of a Colonial Revival bungalow which also dates to about 1910. 960 McLellan is an gabled Italianate residence with many of its characteristic architectural features intact. It is recommended that prior to demolition of these structures that an opportunity for the salvage of architectural features be provided to the San Jose Historical Museum and the Victorian Preservation Association. Many similar structures at the Museum and throughout San Jose are being restored or rehabilitated, and these hard to obtain architectural elements should be made available for re-use.

Two bridges were evaluated in Reach 6. The West Virginia Street bridge was designed by City of San Jose engineer, William Lotz during the 1920s. This two lane concrete girder bridge has two spans and a slight arch. The railings have molded panels. This standard bridge is has lacks significant historical or engineering merit.

The Southern Pacific Railroad trestle crossed the Guadalupe River between Edwards Avenue and Willow Street. The substructure of this bridge consists of both wood pilings and two concrete girders with steel spans. The central concrete substructure is dated 1917. The superstructure consists of a single track with post and cable railings. This bridge lacks significant historical or engineering merit.

Reach 7

Seven structures were evaluated in Reach 7. This area was developed after 1887; however, none of the structures from this period remain within the impact zone. The oldest structure is the Franciscan Press commercial building at 445 Willow Street which dates to the mid-1920s. The other structures in this reach date to the 1950s and 1960s. None of the structures in Reach 7 have architectural or historical significance.

The Western Pacific Railroad trestle is located near Padres Drive in Reach 7. The Western Pacific constructed a railroad line through Willow Glen

Reach 8

Twenty-three structures will be impacted by the Flood Control Project in Reach 8. All of the buildings were constructed during the early 1950s as part of the River Glen Tract No. 710. These early tract houses are variations of the Ranch or Minimal Traditional architectural styles. None of these structures is historically or architecturally significant.

The Willow Glen Way footbridge, originally located at the Lincoln Avenue crossing Los Gatos Creek, was constructed in 1932. This single span bridge has Warren truss railings and a sheet iron floor. The substructure consists of concrete footings on the banks of the river. City records indicate that the bridge was transferred to the City by the County in 1956 and that Clifford and Bodenhamer were the contractors that relocated the bridge to its present location for $9000. A footbridge was needed in this location for the safety of pedestrians then using the narrow vehicular bridge (Dept. of Public Works, Carton #02569).

Reach 9

Nine structures were evaluated in Reach 9. Six houses are located on the south end of Guadalupe Avenue. These tract houses were constructed in the mid-1940s in a simple Ranch style. Two structures are located on Malone Avenue. 760 Malone is a Shingle style built about 1900. This structure has been impacted by the addition of stucco siding, but retains some marginal architectural value. The house at 790 Malone is a vernacular residence constructed about 1925. 1891 Almaden Road was constructed about 1925 in a simple bungalow style. Other than 760 Malone, none of the structures in this reach have historical or architectural value. Although 790 Malone has been impacted, it is possible that some architectural elements may be salvageable for re-use by the San Jose Historical Museum or the Victorian Preservation Association.

Reach 10

The Valley View Packing Company complex at 1095 Hillsdale Avenue was evaluated and found to have moderate historical significance. This company is one of the few remaining family owned and operated fruit processing enterprises left in the Santa Clara Valley. The company was started from a small family orchard operation by the Rubino family in the 1930s and has steadily expanded with orchards throughout the state and a worldwide distribution of its products. The Rubinos were involved in the development the modern prune dehydrator in 1935, the possible proto-type of which may be located within the impact zone of the Flood Control project. This dehydrator consists of a series of tunnels that dried prunes with a uniform flow of heated air. The family patriarch, Pietro Rubino, constructed a residence in the 1930s that is also located within the impact zone. This structure a one-story stucco bungalow with Prairie style details. Three generations of Rubinos occupied the house until 1974. The structure has been well-maintained and presently houses company offices. Due to the structure's age, style, and associations it has moderate historical value. If preservation is not possible, it is recommended that relocation of the structure on site be considered. Minimum recommendations would include photographic documentation and the salvage of significant architectural elements.

The Rubino family and the Valley View Packing Company have made significant contributions to the fruit processing industry in the Santa Clara Valley and California. The prune dehydrator is an early prototype of a new prune dehydrating process developed by the Rubino brothers in the late 1930s. It is a significant resource according to criterion A of the National Register standards because of its important role in the development of the fruit processing industry in the Valley. If the preservation of this resource on site is not possible, relocation of the dehydrator to another portion of the property or to the San Jose Historical Museum should be considered. Minimal recommendations would include photographic and archival documentation that includes oral interviews with the Rubino family, and salvage of signficant elements.

The historic site, CA-SCl-635H, is a redwood retaining wall located 35 feet east of the Guadalupe River near the top of the river bank. This historic site was first noted in a 1985 cultural resource evaluation of this area conducted by ARM (Cartier 1985). At that time the feature was believed to have been built to control erosion. The site was recorded by Basin Research Associates in 1987. No other archival information about this feature was available. In test excavations for the current study, it was found that the vertical redwood planks of the wall continue beyond a depth of 265 cm, and there was a historic waste component in the surrounding soils. It is likely that the feature is associated with flood control activities dating from the 1860s and 1870s. More detailed information regarding the excavation and significance of this site is available in the archaeological element of this study.

Reach 11

One structure was evaluated in Reach 11 at 13958 Almaden Expressway. This residence was constructed in 1956 and has no historical or architectural value.

Guadalupe Creek Reach

The Almaden Winery site is located adjacent to the Flood Control right-of-way. This agricultural/industrial site dates to the 1850s. It is a California Register Landmark and is listed on the National Register of Historic Places. Historic structures on this site are well-outside the project area and no known associated archaeological features are known to exist near the project boundaries. There is, however, a double row of forty-one historic cedar trees located on the southern boundary of the Winery property, adjacent to the northern boundary of the Flood Control project limits (City of San Jose 1990). The proposed use of this reach for revegetation would involve only minor subsurface soil alterations that would not significantly impact the historic trees.

SUMMARY OF STRUCTURE EVALUATIONS

REACH 6 (53 Structures)

House #	Street	APN	Construction Date	Architectural Style	Subdivision	Date of Subdivision	Level of Significance	Mitigation
334	Grant St.	264-35-19	1910	Neo-Classical	Emerald Isle	1903	marginal	Salvage
336	Grant St.	264-35-19	1950	Ranch	Emerald Isle	1903	none	none
340	Grant St.	264-35-17	c1903	False Front	Emerald Isle	1903	none	none
665	Palm	264-35-19	c1956	Ranch	Emerald Isle	1903	none	none
675	Palm		c1960	Vernacular	Emerald Isle	1903	none	none
677	Palm	264-35-21	c1903	Vernacular	Emerald Isle	1903	none	none
689	Palm	264-35-23	c1905	Vernacular	Emerald Isle	1903	none	none
693	Palm	264-35-24	c1910	Vernacular	Emerald Isle	1903	marginal	salvage
695	Palm	264-35-25	c1946	Minimal Traditional	Emerald Isle	1903	none	none
697	Palm	264-35-26	c1905	Neo-Classical	Emerald Isle	1903	none	none
707	Palm	264-35-29	1908	Vernacular	Conkling & Col	1912	none	none
717	Palm	264-35-93	1906	Colonial Revival	Conkling & Col	1912	marginal	salvage
723-725	Palm	264-35-94	1925	Spanish Eclectic	Conkling & Col	1912	none	none
375	McLellan	264-35-27	gone		Emerald Isle	1903		
376	McLellan	264-35-49	1948	Bungalow	Emerald Isle	1903	none	none
377	McLellan	264-35-28	1923	Vernacular	Emerald Isle	1903	none	none
760/762	McLellan	264-35-48	1964	Ranch	Emerald Isle	1903	none	none
766	McLellan	264-35-47	1932	Vernacular	Emerald Isle	1903	none	none
768	McLellan	264-35-46	1918	Bungalow	Emerald Isle	1903	none	none
770	McLellan	264-35-45	c1900	Vernacular	Emerald Isle	1903	none	none
772	McLellan	264-35-44	c1898	Vernacular	Emerald Isle	1903	none	none
774	McLellan	264-35-43	c1870s	Italianate	Emerald Isle	1903	none	none
802	McLellan	264-40-38	1950	Minimal Traditional	Conkling & Col	1912	none	none
810	McLellan	264-40-94	1927	Vernacular	Conkling & Col	1912	none	none
820	McLellan	264-40-93	1954	Ranch	Conkling & Col	1912	none	none
832	McLellan	264-40-92	1910	Colonial Revival	Conkling & Col	1912	none	none
846	McLellan	264-40-118	1949	Vernacular	Conkling & Col	1912	none	none
848	McLellan	264-40-118	1949	Vernacular	Conkling & Col	1912	none	none

REACH 6 continued

House #	Street	APN	Construction Date	Architectural Style	Subdivision	Date of Subdivision	Level of Significance	Mitigation
850	McLellan	264-40-118	1935	Bungalow	Conkling & Col	1912	none	none
864	McLellan	264-40-118	1954	Ranch	Conkling & Col	1912	none	none
878	McLellan	264-40-118	c1890	Pioneer	Conkling & Col	1912	none	none
888	McLellan	264-40-118	1959	Modern	Conkling & Col	1912	none	none
896-898	McLellan	264-40-85	1953	Ranch	Conkling & Col	1912	none	none
908	McLellan	264-40-84	1955	Ranch	Conkling & Col	1912	none	none
920-922	McLellan	264-40-53	1957	Ranch	Conkling & Col	1912	none	none
926	McLellan	264-40-82	1915	Vernacular	Conkling & Col	1912	none	none
932-934	McLellan	264-40-81	1959	Ranch	Conkling & Col	1912	none	none
940	McLellan	264-40-80	1910	Bungalow	Conkling & Col	1912	none	none
952	McLellan	264-40-78	1960	Ranch	Palm Tract	1905	none	none
960	McLellan	264-40-103	c1880	Italianate	Palm Tract	1905	marginal	salvage
964	McLellan	264-40-117	1974	Ranch	Palm Tract	1905	none	none
966	McLellan	264-40-116	1974	Ranch	Palm Tract	1905	none	none
965-967	McLellan	264-48-86	1952	Ranch	Palm Tract	1905	none	none
968	McLellan	264-40-76	1912	Vernacular	Palm Tract	1905	none	none
971-972	McLellan	264-48-87	1952	Ranch	Palm Tract	1905	none	none
335	W. Virginia	264-35-40	1934	Bungalow	Conkling & Col	1905	none	none
337	W. Virginia	264-35-41	1955	Period Revival	Conkling & Col	1905	none	none
339	W. Virginia	264-35-42	1958	Vernacular	Conkling & Col	1905	none	none
805	Harliss	264-40-99	1943	Minimal Traditional	Conkling & Col	1905	none	none
807	Harliss	264-40-40	1948	Vernacular	Conkling & Col	1905	none	none
811	Harliss	264-40-41	1937	Minimal Traditional	Conkling & Col	1905	none	none
817	Harliss	264-40-42	1937	Minimal Traditional	Conkling & Col	1905	none	none
821	Harliss	264-40-43	1938	Minimal Traditional	Conkling & Col	1905	none	none

REACH 7 (7 Structures)

House #	Street	APN	Construction Date	Architectural Style	Subdivision	Date of Subdivision	Level of Significance	Mitigation
1125	Lelong	434-04-11	1960	Warehouse	Willow Glen Tract	1887	none	none
1143-45	Lelong	434-04-12,13	1961	Warehouse	Willow Glen Tract	1887	none	none
1153	Lelong	434-04-14	gone		Willow Glen Tract	1887		
430	Willow St.	434-04-66	gone		Willow Glen Tract	1887		
441	Willow St.	264-48-98	gone		CB Wooster's Sub.	1905		
445	Willow St.	264-48-98	1925	Spanish Eclectic	CB Wooster's Sub.	1905	none	none
450	Willow St.	434-04-03	1954	Modern	Willow Glen Tract	1887	none	none
454	Willow St.	434-04-04	1955	Modern	Willow Glen Tract	1887	none	none
456-458	Willow St.	434-04-03,66	1954 & 1960	Warehouses	Willow Glen Tract	1887	none	none

REACH 8 (23 Structures, sample only)

1507	Mackey	434-27-28	1951	Ranch	River Glen 710	c1950	none	none
1517	Mackey		1955	Ranch	River Glen 710	c1950	none	none
1535	Mackey	434-27-31	1953	Ranch	River Glen 710	c1950	none	none
1593	Mackey	434-27-37	1950	Ranch	River Glen 710	c1950	none	none
1641	Mackey	434-27-42	1950	Minimal Traditional	River Glen 710	c1950	none	none
1651	Mackey	434-27-43	1950	Ranch	River Glen 710	c1950	none	none
1671	Mackey	434-27-45	1950	Ranch	River Glen 710	c1950	none	none
525	Northern	434-27-110	1950	Ranch	Heple & Moulton	c1950	none	none
535	Northern	434-27-111	1955	Ranch	Heple & Moulton	c1950	none	none

REACH 9 (9 Structures, sample only)

House #	Street	APN	Construction Date	Architectural Style	Subdivision	Date of Subdivision	Level of Significance	Mitigation
1727-1756	Guadalupe	445-21-14to19	c1945	Ranch	John Franklin Partition of Willow Glen Villa Tract 141	c1940	none	none
760	Malone	439-26-62	c1900	Shingle	Hamilton Ranch	1897	minimal	salvage
790	Malone	439-26-60	c1925	Vernacular	Hamilton Ranch	1897	none	none
1891	Old Almaden	455-21-56	c1925	Bungalow	Herschbach's Subdivision	1922	none	none

REACH 10B

1095	Hillsdale Ave.	455-12-3,7	1938+ 1935 c1938	Industrial complex Bungalow, Prairie Dehydrator	Pearl Ranch	1899	moderate moderate high	none salvage see report

REACH 11 (1 Structure)

13958	Almaden Exp.	459-02-03	1956	Ranch	Henderson Tract, lot 13	1967	none	none

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n.d. #2987. Map of M. W. Reed Tract.

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APPENDIX B

GENERAL CONSTRUCTION PROCEDURES OF THE PREFERRED PROJECT

Reach A: Highway 101 to Interstate 880

General Construction Procedures

Typical construction of the floodwall along Airport Boulevard just downstream of Airport Parkway Bridge would begin with trench excavation, followed by form work installation, concrete pouring, backfill and aesthetic texturing on the face of the wall.

The construction of continuous access under bridges includes removal of channel bank lining upstream and downstream of the bridges, ramp construction and gabions installation. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Possible staging area for the construction equipment would be at the top of the west bank upstream and downstream of Airport Island Bridge, Airport Parkway Bridge and Interstate 880 Overpass. Access to the construction area would be at Airport Island Bridge, Airport Boulevard, and Airport Parkway.

Reach 6: Interstate 280 to SPRR—Gabion Bypass Channel

General Construction Procedures

Typical construction of a bypass channel would begin with installation of temporary construction fences and warning signs, followed by removal of pavement, vegetation and fences, demolition of buildings and other existing structures, and relocation of existing utilities.

After relocation of utilities, the bypass channel would be excavated. The bypass channel bottom would be graded and rock lined. On the channel slopes, stepped gabions would be installed and backfill would be compacted behind the gabions. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Construction of the bypass channel would also include constructing a new bridge at West Virginia Street which involves traffic control, excavation, piling, form work installation, concrete pouring, backfill, and pavement construction.

Construction of levee on the west bank of the natural stream channel would consist of clearing and grubbing, placing and compacting material from bypass channel excavation for the levee, and constructing a maintenance road on top of the levee.

Revegetation areas in this reach would be planted with riparian plant species as designated in the mitigation plan after all construction activities are completed; typically this would be done in fall for the best survival rates.

Possible staging area for the construction equipment would be within the proposed right of way of the bypass channel or in revegetation areas. Access to the construction area would be at Palm Street, West Virginia Street, and Edwards Avenue.

Reach 7: SPRR to Union Pacific Railroad—Composite Bypass Channel

General Construction Procedures

Construction of the bypass channel, the new bridge at Willow Street, and the levee just upstream of Alma Avenue would be as described for in Reach 6.

The RCB culverts under SPRR and UPRR would be jacked. Typically, the box culverts would be constructed on site and later jacked under the railroads by pushing or pulling on either side of the crossings. If the Southern Pacific and Union Pacific Transportation Companies would allow track closure for temporary bridge installation, then the jacking method would not be used. Installation of a temporary bridge would involve raising the track profile, driving of piles, removing both existing tracks, installing shoring and placing of structural steel beams and diaphragms. After the temporary bridge construction, tracks would be reinstalled, including rails, ties and ballast. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

The contractor would conduct his operation adjacent to the Railroad facilities and within the Railroad right of way in such a manner to maintain the structures and the area in a good and safe condition.

The contractor would comply with the Railroad's rules, regulations, and instructions governing the use of signals and flags for signaling or flagging trains, as a protection against accidents, and governing the protection of tracks and property of Railroad and the traffic moving on such tracks, as well as wires, signals, and other property, at or in the vicinity of the construction area.

Floodwall construction along Lelong Street just downstream of Alma Avenue and at the Elk's Lodge would consist of trench excavation, form work installation, concrete pouring, backfill and aesthetic texturing on the face of the wall.

Revegetation areas in this reach would be planted with riparian plant species as designated in the mitigation plan after all construction activities are completed; typically this would be done in fall for the best survival rates.

Possible staging area for the construction equipment would be within the proposed right of way of the bypass channel or in revegetation areas. Access to the construction area would be at Willow Street, along Lelong Street, and Alma Avenue.

Reach 8: UPRR to Willow Glen Way—Gabion Bypass Channel

General Construction Procedures

Construction of the bypass channel would be as described for in Reach 6.

Construction of the gabion diversion structure located just downstream of Willow Glen Way would consist of trench excavation, gabion installation, and back fill. Water flowing in the river may be blocked and diverted from around the construction area using pumps and pipes. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Possible staging area for the construction equipment would be within the proposed right of way of the bypass channel or in revegetation areas. Access to the construction area would be at Mackey Avenue and Willow Glen Way.

Revegetation would be as described for Reach 7.

Reaches 9 and 10A: Willow Glen Way to Southbound Almaden Expressway—Widened Cribwall Channel

General Construction Procedures

Construction of the two short bypasses (Pine and Malone Islands), and Willow Glen Way and Curtner Avenue Bridges would be as described for in Reach 6. Water flowing in the river during bridge construction may be blocked and diverted around the construction area using pumps and pipes. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Prior to channel excavation at the SJWC, existing wells and associated facilities in the construction area would be relocated. Locations of the new wells would be coordinated with the SJWC in advance of channel construction. A temporary shoring system would be installed to stabilize the bank and adjacent ground during channel excavation. The shoring system could consist of sheet piles or soldier piles with lagging.

After installation of the shoring system, the bank would be excavated to widen the channel. The widened depressed bench would be graded and stepped gabions and cribwalls would be installed on the channel slope. Along Almaden Road, the contractor would provide temporary railing between the traffic lane and excavation or storage area. There will be traffic control and possibly detours required for construction of cribwall. All works would be coordinated with the City. Excavation would most likely be performed from the depressed bench.

Possible access to the erosion site at Pine Avenue would be from the channel invert and Pine Avenue. The eroded bank would be sloped back for stepped gabion installation, and backfill would be compacted behind the gabions. Water flowing in the river may be blocked and diverted around the construction area using pumps and pipes.

Possible access to the erosion site upstream of Malone Road would be from the channel invert. Stepped gabion installation on the bank would be as described for Pine Avenue.

Revegetation areas in this reach would be planted with riparian plant species as designated in the mitigation plan after all construction activities are completed; typically this would be done in fall for the best survival rates.

Staging area for the construction equipment would be at Pine and Malone Islands. Access to the construction area would be at Willow Glen Way and along Almaden Road.

Reaches 10B and 10C: Southbound Almaden Expressway to Capitol Expressway—Levee and Widened Gabion Channel

General Construction Procedures

Construction of the levee and floodwall between southbound and northbound of Almaden Expressway, and Pearl Avenue bridge would be as described for Reaches 6 and 7. Water flowing in the river during Pearl Avenue Bridge construction may be blocked and diverted around the construction area using pumps and pipes. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Channel widening between northbound Almaden Expressway and Gage Station 23B would consist of excavation of the depressed bench and removal of gabions, and relocation of rock lining in the channel bottom to create a low-flow channel. Water flowing in the river may be blocked and diverted around the construction area using pumps and pipes.

From Gage Station 23B to Capitol Expressway, the channel would be excavated to the east. The depressed bench would be graded and stepped gabions would be installed on the channel slope. The west bank between Hillsdale Avenue and Capitol Expressway would be sloped back for stepped gabions installation and backfill would be compacted behind the gabions. Work would be performed from the channel invert. Water flowing in the river would be blocked and diverted around the construction area using pumps and pipes.

Hillsdale Avenue Bridge would be removed only after Pearl Avenue Bridge is constructed. No major impact to traffic is anticipated. An abandoned stream gage station just downstream of the bridge would also be removed. Removal of the stream gage station would most likely be performed as part of grading and excavation.

Revegetation areas in this reach would be planted with riparian plant species as designated in the mitigation plan after all construction activities are completed; typically this would be done in fall for the best survival rates.

Possible staging area for the construction equipment would be within the proposed right of way of the widened bench or revegetation areas. Access to the construction area would be at Wren Avenue, new Pearl Avenue, frontage road along the east top of bank, and Hillsdale Avenue.

Reach 11: Capitol Expressway to Branham Lane—Widened Gabion Channel

General Construction Procedures

Construction of the bypass channel would be as described for Reach 6.

The east bank widening along Almaden Expressway would consist of excavation, stepped gabions installation, and backfill behind the gabions. Fish barriers and concrete rubble in the channel bottom would be removed. Typically, most of the construction would be performed from the channel invert. Water flowing in the river may be blocked and diverted around the construction area using pumps and pipes. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Prior to the west bank excavation, a shoring system would be installed. The shoring system could consist of sheet piles or soldier piles with lagging. Traffic control on Almaden Expressway would be provided during installation of the shoring system.

Prior to excavation at the SJWC property, one well and associated facilities in the construction area would be relocated. Location of the new well would be coordinated with SJWC in advance of channel construction.

Revegetation areas in this reach would be planted with riparian plant species as designated in the mitigation plan after all construction activities are completed; typically this would be done in fall for the best survival rates.

Possible staging area for the construction equipment would be at east top of bank adjacent to Almaden Expressway and top of bank just upstream of Ross Creek confluence. Access to the construction area would be at the existing easement on the Larson property, the channel bottom, and SJWC property.

Reach 12: Branham Lane to Blossom Hill Road—Levee and Revegetation Area

General Construction Procedures

Prior to excavation of wetland mitigation ponds in the designated area, the first 2 feet of top soil would be removed and stockpiled on site.

After the mitigation ponds are excavated, the banks would be graded to a slope 2:1. Stockpiled topsoil would then be reapplied to the areas where revegetation is to occur.

Construction of the levees from Chynoweth Avenue to Blossom Hill Road would consist of excavation of the existing levees, replacing and compacting the soil excavated to the standard compaction test, and construction of maintenance roads on top of levees. Additional soil from the mitigation ponds excavation could potentially be used to reconstruct the levees.

Typically, most construction will be performed from the channel invert. Water flowing in the river may be blocked and diverted around the construction area using pumps and pipes. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Revegetation areas in this reach would be planted with riparian plant species as designated in the mitigation plan after all construction activities are completed; typically this would be done in fall for the best survival rates.

Possible staging area for the construction equipment would be within the proposed right of way of the mitigation area. Access to the construction area would be at Branham Lane, Chynoweth Avenue, and Blossom Hill Road.

Canoas Creek: Almaden Expressway to Nightingale Drive—Floodwalls

General Construction Procedures

Construction of the box culvert under Almaden Expressway would be staged so as to maintain three lanes open for traffic. Typically, this could be accomplished by relocating the existing three northbound lanes to the space currently occupied by a right-turn lane and a frontage road. This would necessitate temporary closure of the right-turn lane and the frontage road, during the time when the west half of the new culvert would be constructed. Then the expressway would be moved back to allow construction of the remainder of the culvert, after which the turn lane and frontage road could reopen.

Prior to construction of the box culvert under Almaden Expressway, a shoring system would be installed. The shoring system could consist of sheet piles or soldier piles with lagging.

After the installation of the shoring system, the channel would be excavated. The box culvert bottom would be poured, followed by form work installation and pouring of the culvert walls and soffit. After completion of the culvert and removal of form work, backfill would be placed behind the culvert walls, and roadway paved.

Construction of the box culvert under Nightingale Drive would be similar to Almaden Expressway, except Nightingale Drive would be temporarily closed and traffic would be detoured. Southbound traffic could use the frontage road along Northbound Almaden Expressway while northbound traffic could use Redbird Drive and the frontage road.

The construction of culverts under Almaden Expressway and Nightingale Drive would be scheduled at separate times.

Water flowing in the creek during the culverts construction may be blocked and diverted around the construction area using pumps and pipes. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Floodwalls construction along the north and south top of banks would consist of trench excavation, form work installation, concrete pouring, backfill, and aesthetic texturing on the face of the walls. Structures which are damaged as a result of construction would be repaired or replaced.

Possible staging area for the construction equipment would be at Reach 10 construction areas. Access to the construction area would be at Almaden Expressway and Nightingale Drive.

Ross Creek: Almaden Expressway to 700 Feet Upstream of Jarvis Avenue—Widened Channel with ACM Lining

General Construction Procedures

Prior to construction of the box culvert under Almaden Expressway, a shoring system would be installed. The shoring system could consist of sheet piles or soldier piles with lagging.

After the installation of shoring system, the channel would be excavated. The box culvert bottom would be poured, followed by form work installation and pouring of the culvert walls and soffit. After completion of the culvert and removal of form work, backfill would be placed behind the culvert walls, and roadway paved.

Construction of the box culvert under Almaden Expressway would be staged so as to maintain three lanes open for traffic in each direction. Typically, this could be accomplished by construction of temporary roadways with a three-stage construction schedule. First, by utilizing the median and westerly shoulder, the northbound and southbound roadways would be relocated westerly to allow construction of ⅓ of the box culvert. Second, the northbound lanes would be moved easterly to allow the center ⅓ of the culvert to be constructed. Lastly, by utilizing the median, the southbound lanes would be moved easterly to allow the remaining ⅓ of the culvert to be constructed.

Construction of the box culvert under Jarvis Avenue would be similar to Almaden Expressway, except Jarvis Avenue would be temporarily closed and traffic would be detoured to Cherry Avenue.

Channel widening would consist of excavation, installation of ACM lining and backfill the channel bottom. Structures which are damaged as a result of excavation would be repaired or replaced.

Water flowing in the creek during the culvert's construction and channel widening may be blocked and diverted around the construction area using pumps and pipes. Coffer dams will likely be needed for most construction. The California Construction BMP would be implemented.

Possible staging area for the construction equipment would be at Reach 11 construction areas. Access to the construction area would be Briarglen Drive, Cherry Avenue and Jarvis Avenue.

APPENDIX C

MAINTENANCE PROGRAM

MAINTENANCE PROGRAM

This section discusses the anticipated maintenance activities and guidelines to determine when channel maintenance is necessary. Upon completion of construction, the activities and guidelines presented in this chapter would supersede the existing maintenance program, which is performed according to the current MOU with the CDFG.

Maintenance Activities

The project will have a maintenance program which will include erosion protection, vegetation removal, and sediment removal. The goals of the maintenance program include restoring the facilities to the design condition, which existed following construction, repairing the facility as necessary and eliminating hazardous conditions. The hazardous conditions include eroding banks, presence of large dead or fallen trees, and excessive trash and debris.

The general tasks to be performed during annual maintenance include damaged gabion and fencing repairs, trash and debris removal, weed control, and elimination of potentially hazardous conditions. Annual inspection and periodic removal of sediment and woody vegetation in the waterway, and restoration of abraded concrete and damaged diversion structures will also be necessary.

Vegetation and sediment would be allowed to accumulate to a predefined level at which time the design condition will be restored by maintenance activities. The vegetation will provide additional unaccounted for, habitat value and shading during the time between maintenance cycles. Therefore, there would be no adverse impacts from the vegetation removal activities and no mitigation would be required. If sediment never reach the predefined level, maintenance would not be required.

Sites which are actively eroding would be subjected to progressively increasing remedial actions. Severe erosion resulting in potentially hazardous steep banks, bare soil and loss of vegetation is environmentally more impacting than providing protective measures.

Because structural measures are only initiated when the vegetation has already been lost from erosion of the bank and the steep undercutting is unlikely to revegetate naturally, there would not be any environmental impact associated with most remedial repair options. Therefore no mitigation would be required. Mitigation may be required for some repairs. Figure 3.29 shows the examples of before and after high flows banks condition in the Guadalupe River.

Nonemergency work within the channel will be performed outside of the nesting season. Vegetation removal will be scheduled to minimize adverse impacts to fish and wildlife resources. Periods of concern are March through June for birds and October through March for fish.

Maintenance Program for Erosion Repair

Soil erosion in Guadalupe River occurs on the channel banks. As bank erosion occurs, vegetation is lost, habitat is lost, property improvements may be threatened, and channel capacity may be compromised. Increased soil erosion on the channel banks increases suspended sediment in the creek consequently degrading water quality and aquatic habitat.

Sites which are actively eroding will be subjected to either (1) preventative slope protection, or (2) remedial slope protection. Preventative slope protection will be implemented at sites where creek banks are first becoming undercut up to 8 feet vertical (see Figure 3.30). Remedial slope protection will be implemented at sites where preventative maintenance was implemented and failed; where preventative maintenance is highly unlikely to be sufficient to eliminate continued bank erosion; or where the erosion is more than 8 feet vertically on the bank (see Figure 3.30).

1. Preventative Slope Protection

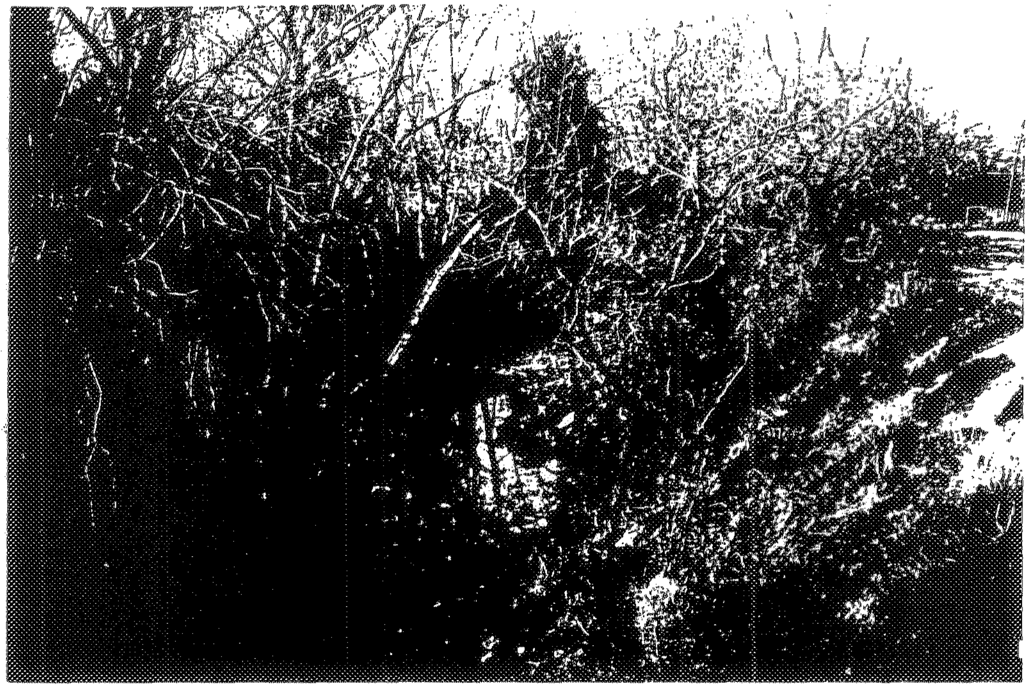
Preventative slope protection consists of protecting the channel bank toe to stabilize the zone of highest erosion potential. The toe of the bank will be stabilized by placement of 1/2-ton rock riprap to a height of at least 4 feet (see Figure 3.31). The riprap will reduce the velocity of flow at the interface and will promote the natural sedimentation around the riprap, and therefore, natural revegetation.

If it is observed that the channel bottom is actively degrading, vortex rock weirs will be installed downstream of the channel bank erosion to prevent any further degradation (Figure 3.32). Bank instability and erosion may, in some cases, be directly correlated to increased bank height due to channel bottom degradation.

The vortex rock weir will be constructed with large boulders vary from 3 to 5 feet in diameter and will be keyed into the bank to eliminate erosion. The weir is constructed in a U-shape, with the point of the "U"facing upstream and span at the minimum the bankfull channel width. This forms a vortex that creates a downstream plunge pool for energy dissipation and aquatic habitat. Footer rocks will be installed for anchoring and prevent undermining.

The weir will provide instream cover and deepen the feeding areas for fish habitat in the riffle reach of the channel. It acts as a grade control structure without upstream lateral migration, bank erosion and aggradation. It also maintains a low width to depth ratio channel which will reduce the likelihood of bar deposition and maintains the sediment transport capacity of the stream.

Vortex rock weirs will be limited to approximately 2 feet in height as shown in Figure 3.33. If more height is needed to stabilize the channel, multiple weirs will be installed.



Looking Downstream Along Almaden Road Downstream of Malone Road

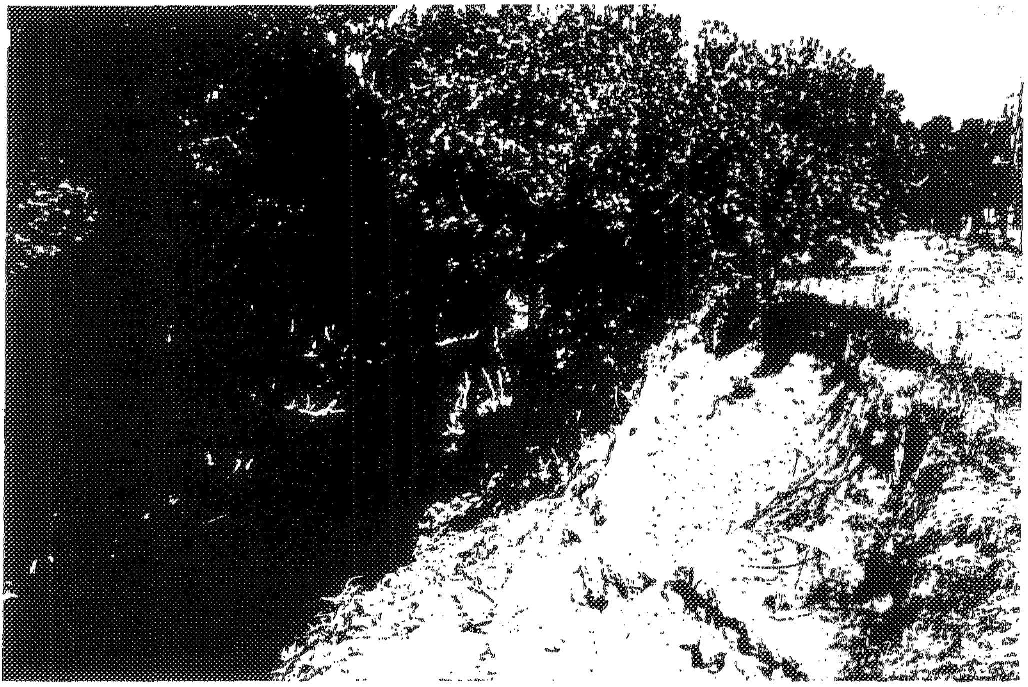
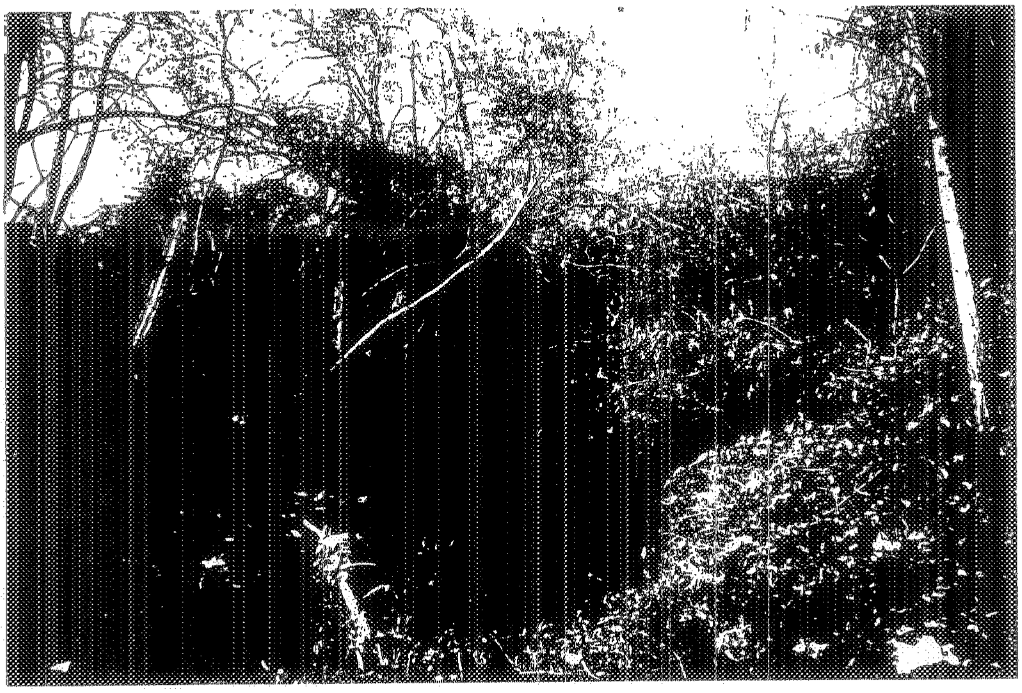


FIGURE 3.29

BEFORE AND AFTER JANUARY AND MARCH 1995 FLOODINGS



Looking Downstream Along Almaden Road Upstream of Malone Road

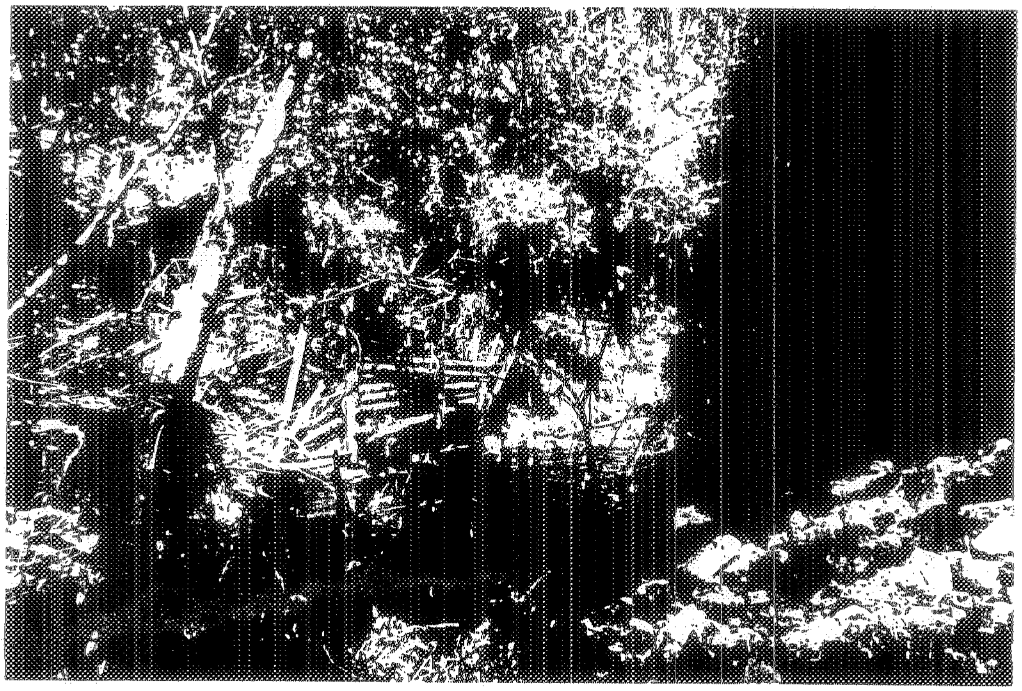
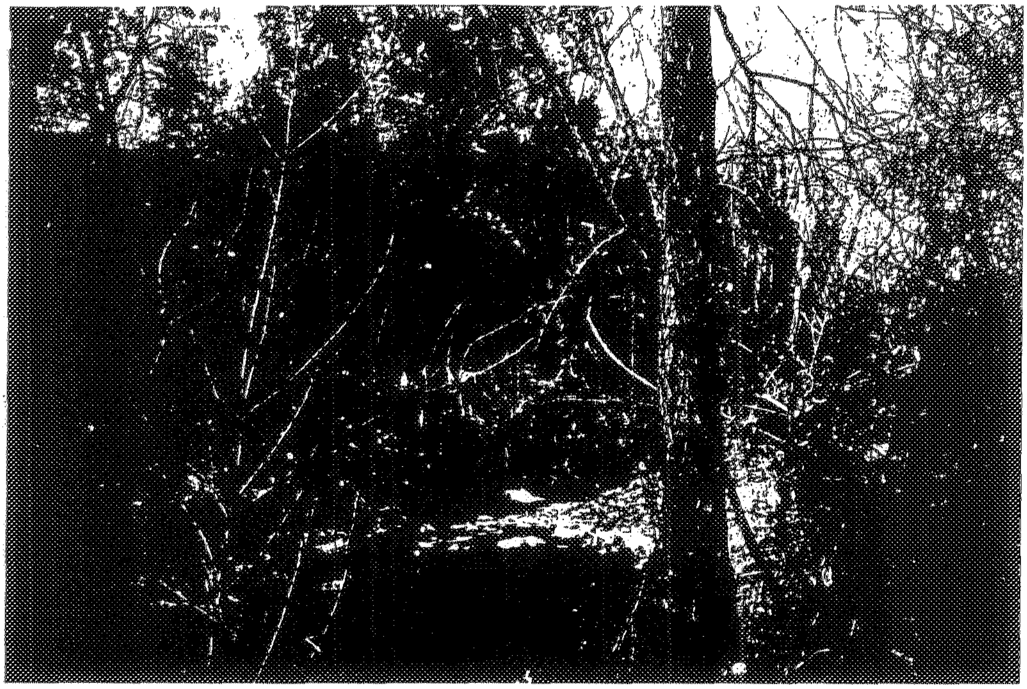


FIGURE 3.29 (CONT'D)

BEFORE AND AFTER JANUARY AND MARCH 1995 FLOODINGS



Looking Downstream Along Almaden Road Downstream of Curtner Avenue

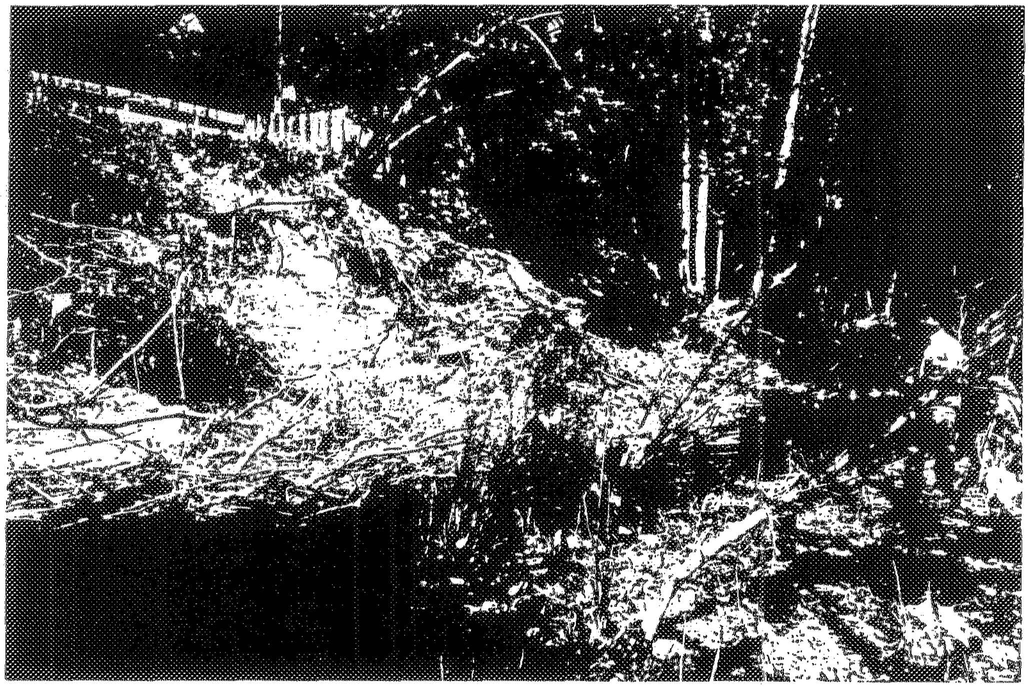
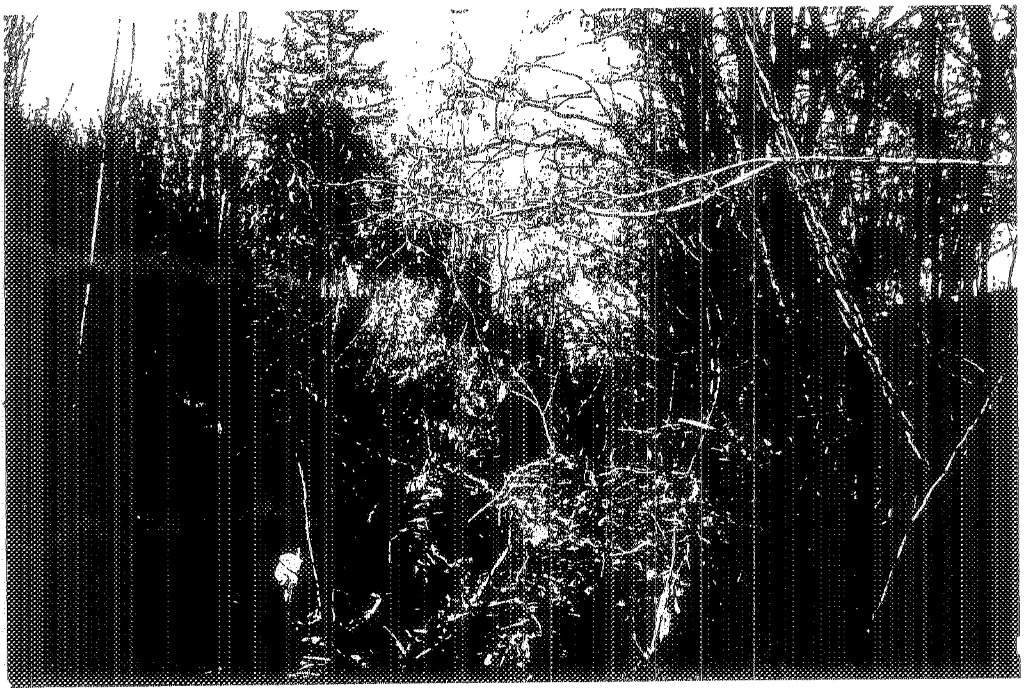


FIGURE 3.29 (CONT'D)
BEFORE AND AFTER JANUARY AND MARCH 1995 FLOODINGS



Looking Downstream Along Almaden Road Upstream of Curtner Avenue

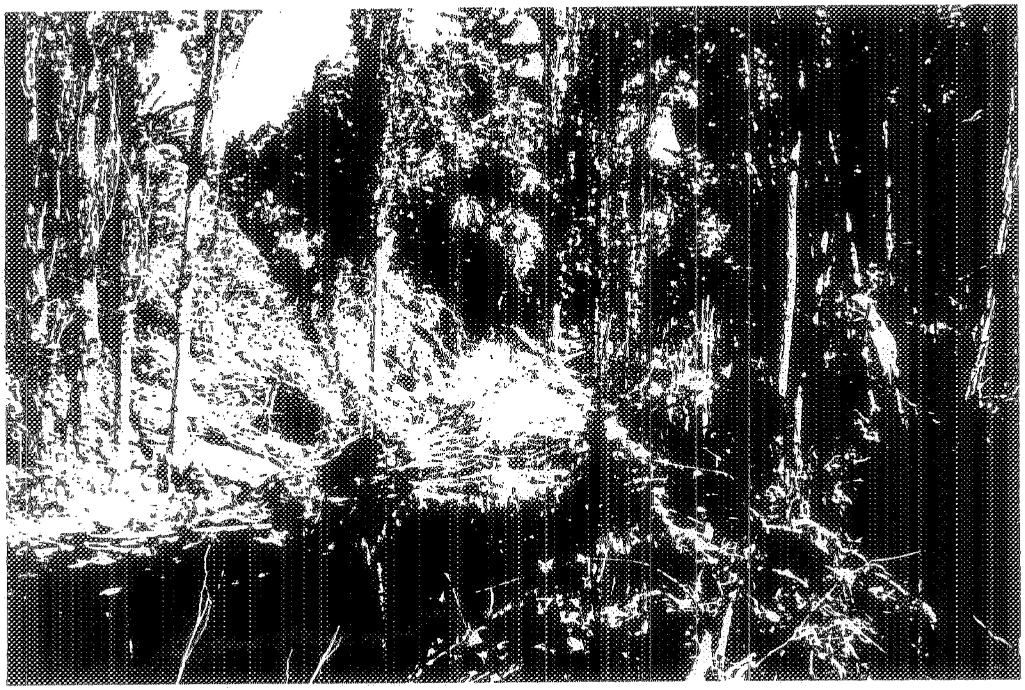
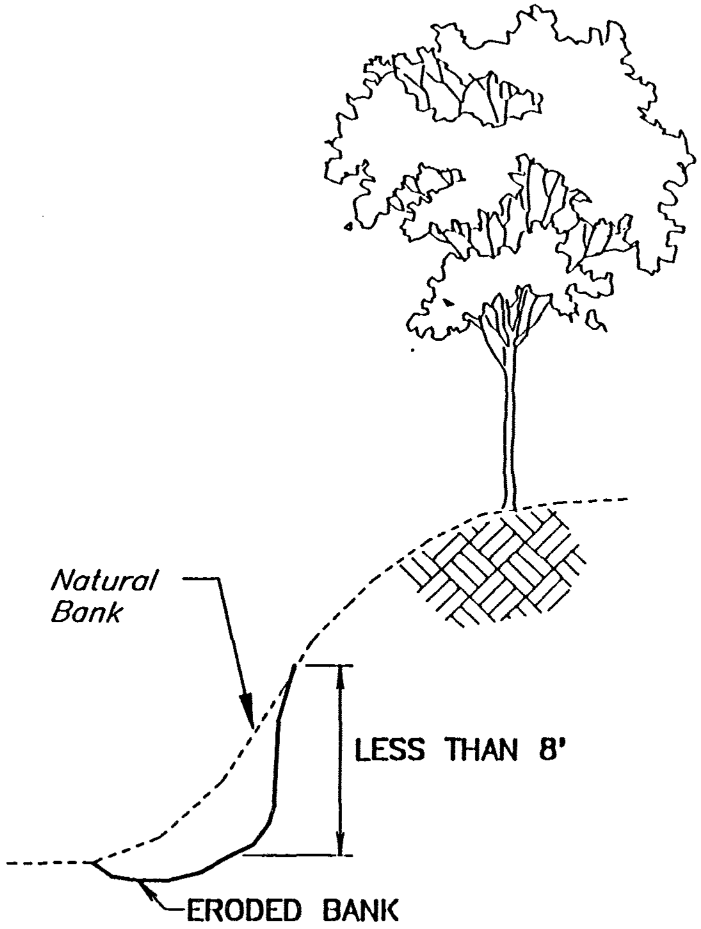


FIGURE 3.29 (CONT'D)

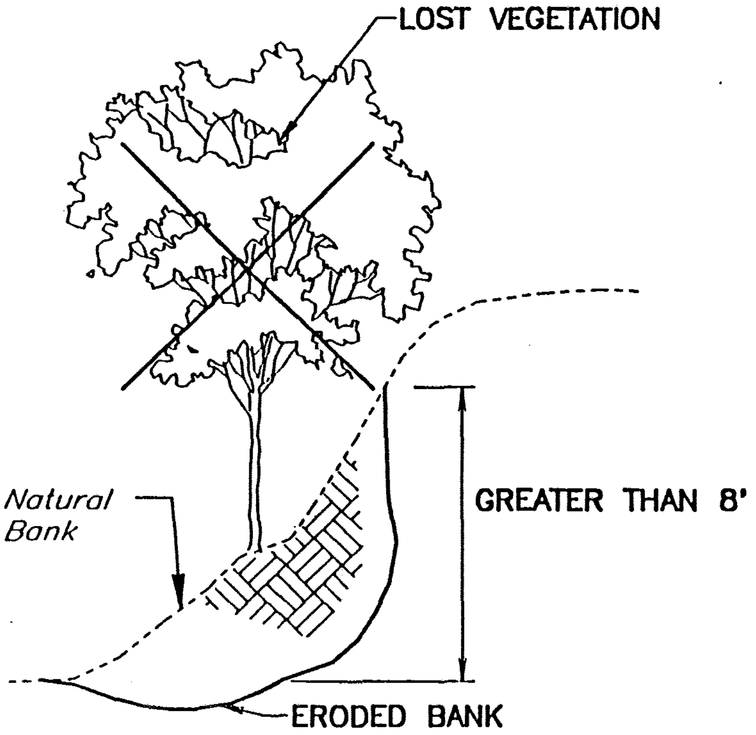
BEFORE AND AFTER JANUARY AND MARCH 1995 FLOODINGS

7101\CS0004

FIGURE 3.30
EROSION SYMPTOMS



PREVENTATIVE EROSION SYMPTOMS



REMEDIAL EROSION SYMPTOMS

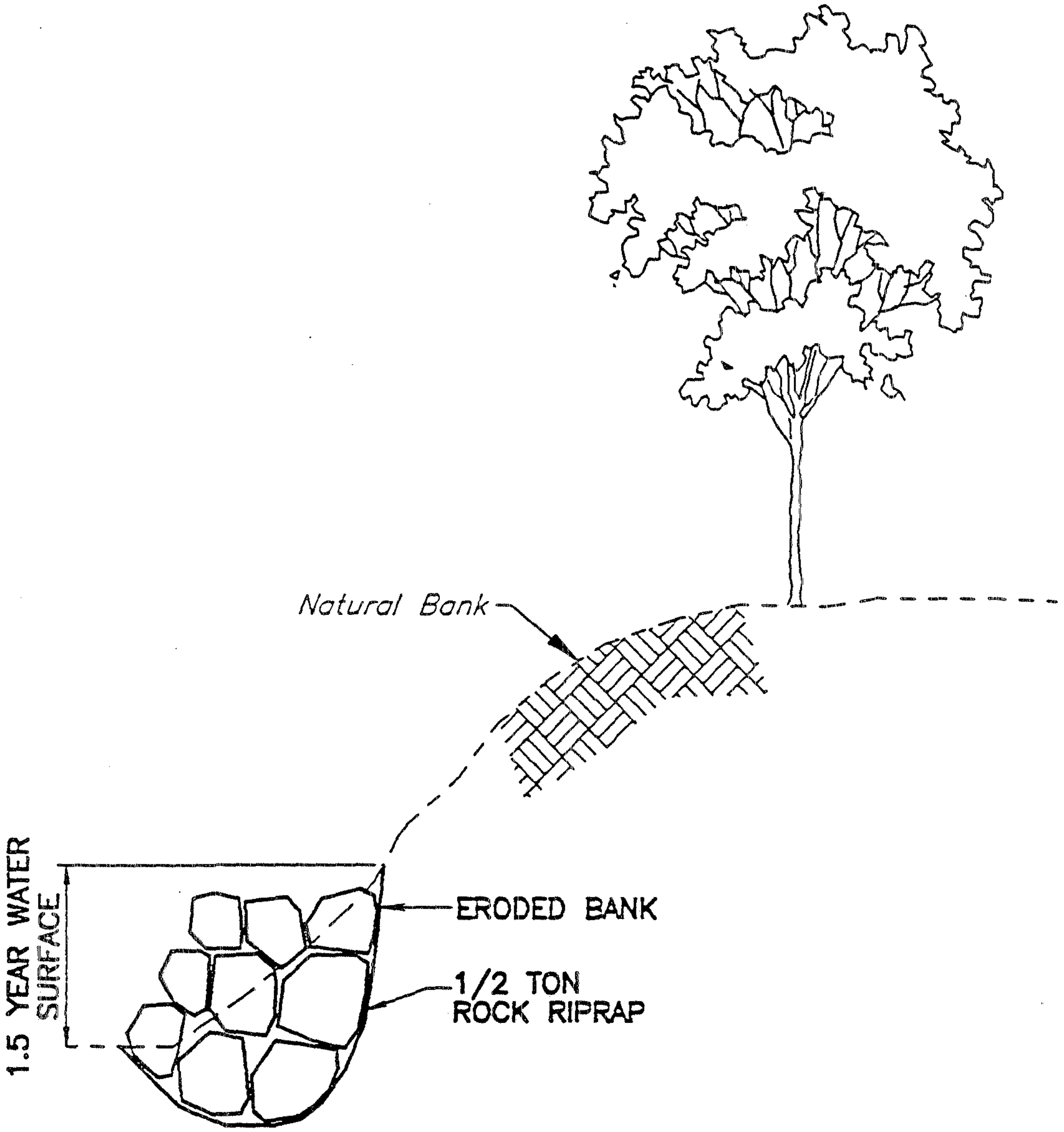


FIGURE **3.31**
PREVENTATIVE EROSION SOLUTION

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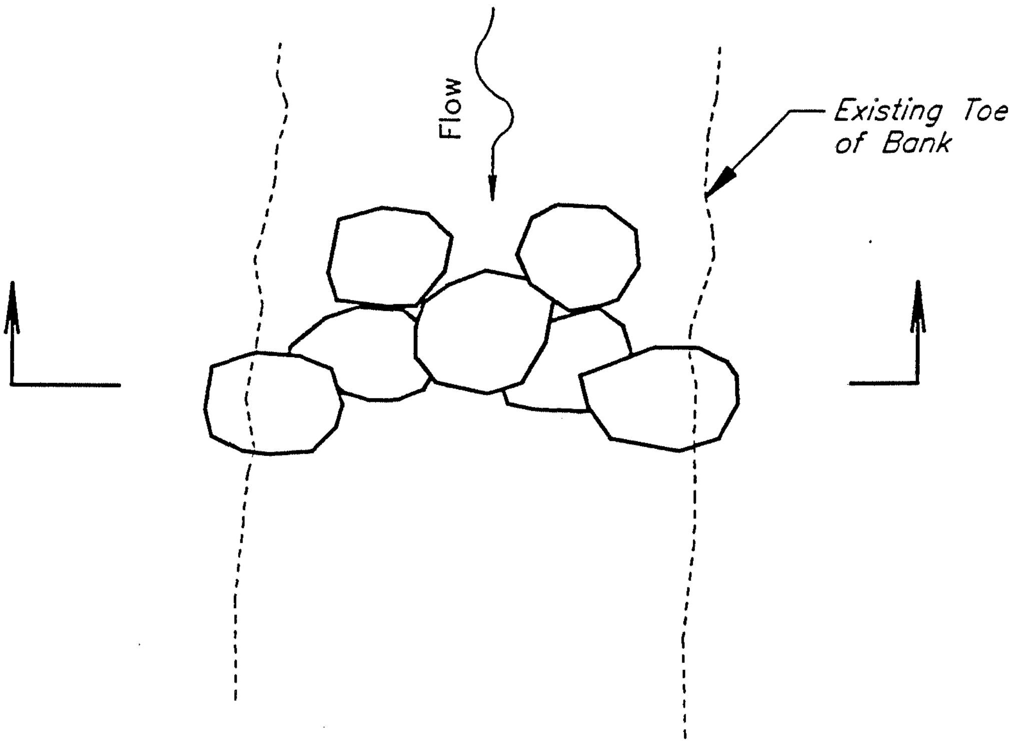
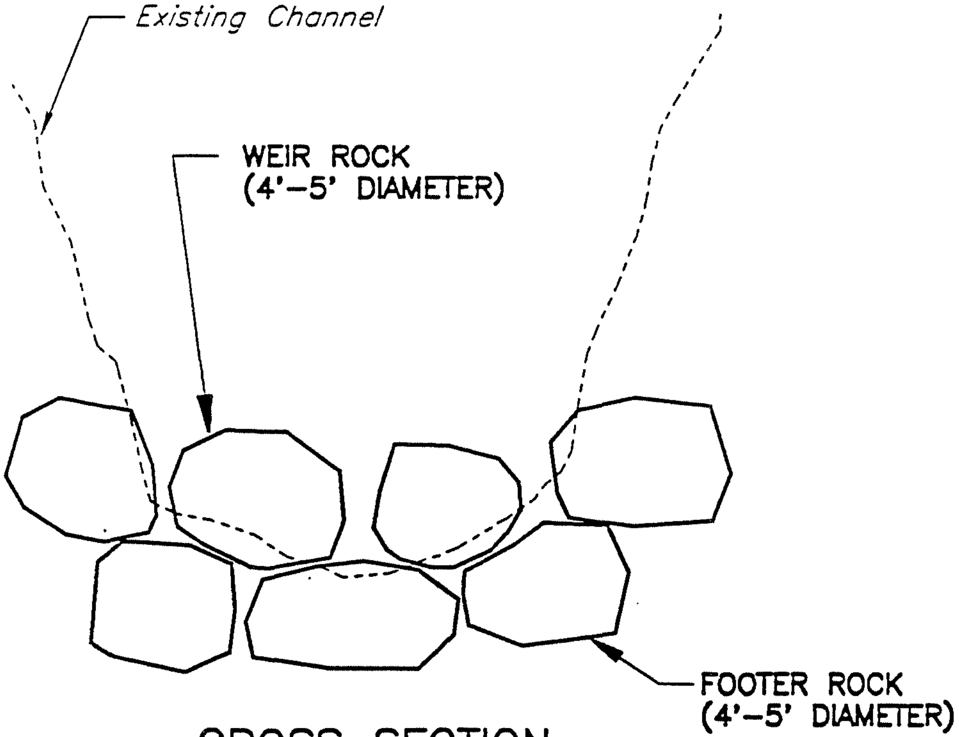


PLAN VIEW



CROSS SECTION

FIGURE 3.32
VORTEX ROCK WEIR

010_101\ACX50012

2. Remedial Slope Protection

Remedial slope protection consists of using nonstructural and structural measures. The nonstructural alternatives would be to regrade the channel banks to a stable configuration. This alternative works best where right of way and mature vegetation does not impose constraints on the available space in which to regrade the channel banks. Acquisition of right of way is a nonstructural measure which may be appropriate when the cost of structural measures are high. In restricted right of way, structural alternatives often are the only viable alternatives that adequately stabilize the channel banks.

Structural measures can be divided into three categories: live construction, mixed construction, and inert construction. Live construction consists of the traditional use of grass and live cuttings. Mixed construction consists of using plant materials often combined with inert materials (rock riprap, gabions, cribwalls, etc.). Live construction and mixed construction, when covered with soil as proposed, or when supplemented with hydroseeding and plantings, will eventually restore the creek bank vegetation and habitat to near the condition which existed prior to the erosion occurring. Inert construction consists of using only inert structural methods.

The various structural alternatives are appropriate for different site conditions. Erosion protection works will be selected when technically feasible to reduce adverse environmental impacts. The objective when selecting erosion protection materials is to meet both engineering and environmental impact criteria. The engineering criteria involve the physical ability of the material to provide reliable structural support within the site constraints, including the ability of the material to provide lateral support to the bank, as well as, provide sustained protection against erosive velocities. The environmental impact criteria used in selecting the remedial measure follows the CEQA guideline for mitigation, which is avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. Once erosion on the earth channel has occurred, the site constraints determined, cause or erosion determined, and ecological setting evaluated, the remedial measures are considered and selected. Depending on the impacts to the environment and the materials availability, the remedial slope protection measures will first be considered **in order as described below**. (See Table 3.20 for summary of remedial slope protection methods.)

Live Construction

Live construction consists of using traditional methods of planting grasses and vegetation to control erosion. Vegetation planting methods typically used are cuttings, transplants, live staking, and direct seeding (including hydro-seeding).

This application is suitable for bank slopes up to 2:1 and flow velocities up to 4 feet per second. Live construction would not be feasible for the Guadalupe River, south of Highway 101, since design channel velocities exceed 4 feet per second.

Mixed Construction

Mixed Construction meets one of the District's goals in keeping current with innovative technologies that serve the public interests, including materials that integrate resource agency goals. This construction method usually involves some bank disturbance and consists of using plant materials often combined with inert materials. Subcategories of Mixed Construction are Soil Bioengineering and Biotechnical Slope Protection.

Soil Bioengineering

Soil Bioengineering consists of using plants and plant parts to control soil erosion. Live cuttings and plant parts are imbedded and arranged so that they act as soil reinforcements, hydraulic drains, or barriers to earth movement. Methods included in this category include contour wattling, brush layering, and bank surface matting.

—Contour Wattling

Contour wattling consists of long bundles of plant stems tied together with twine, anchored in shallow trenches with wooden stakes, and partially backfilled with mildly compacted fill (see Figure 3.34). When the stems develop root systems and mature, the plant (typically willows) establishes structural stabilization properties within the soil root fabric. Protection from erosive flow velocities result from the protective armoring quality provided by the plant's stems and leaves.

This application in suitable for bank slopes up to 2:1 and flow velocities up to 6 feet per second.

—Brush Layering

Brush layering consists of placing live cut branches on the bank and covering them with a lightly compacted layer of soil (see Figure 3.35). The tips of the branches extend out of the bank thus slowing down overbank flow and trapping bank sediment. After the branches take root along their length, they begin to act like horizontal slope drains on the bank.

Similar to live construction, this method provides good revegetation potential. This application is suitable for bank slopes up to 2:1 and flow velocities up to 6 feet per second.

—Bank Surface Matting (Erosion Mats)

Bank surface matting consists of securing plastic, jute, or geotextile fabric surface liners to eroded banks using stakes or staples (see Figure 3.36). These materials provide armor protection against erosive velocities and may be combined with live staking or direct seeding.

This application has good revegetation potential, but like contour wattling, it is limited to bank slopes up to 2:1 and flow velocities up to 6 feet per second.

TABLE 3.20
Summary of Remedial Slope Protection Methods

Erosion Control Technique				
Category	**Method**	**Slope Requirements**	**Flow Velocity Requirements**	**Additional Information**
Live construction	Planting grasses, cuttings, transplants, live staking, seeding	2:1 or flatter	4 fps[1] or less	Not feasible on Guadalupe River due to excessive channel velocities.
Mixed construction—soil bioengineering	Contour wattling	2:1 or flatter	6 fps or less	Plant roots protect soil. Creates benches or terraces to create flat areas. Limited use on Guadalupe River due to high creek velocities.
	Brush layering	2:1 or flatter	6 fps or less	Similar uses and restrictions to contour wattling.
	Bank surface matting	2:1 or flatter	6 fps or less	May be combined with live staking or direct seeding. Similar uses and restrictions to contour wattling.
Mixed construction—biotechnical slope protection	Root wads and boulders	Varies	6 fps or less	For use on the outside of eroding bends. 20 feet of horizontal depth is needed for installation.
	Soil cellular confinement system (structural design)	½:1 or flatter	6 fps or less	Cells are filled with soil and planted with vegetation. Matrix is not biodegradable.
	Rock riprap	1½:1 or flatter	15 fps or less	May be used for preventative as well as remedial protection. May be combined with live staking or direct seeding.
	Gabions	¾:1 or flatter	15 fps or less	Can be planted but vegetation potential is limited.
	Articulated concrete mat	1:1 or flatter	15 fps or less	Can be planted with live staking or direct seeding. Plant growth is restricted to size of cell openings.
	Crib walls	¼:1 or flatter	15 fps or less	Crib walls restrict plant growth due to size of openings. Vegetation improves stability.
Inert construction	Sacked concrete slope protection	½:1 or flatter	15 fps or less	No revegetation potential.
	Gunite	All slopes to vertical	15 fps or less	No revegetation potential.

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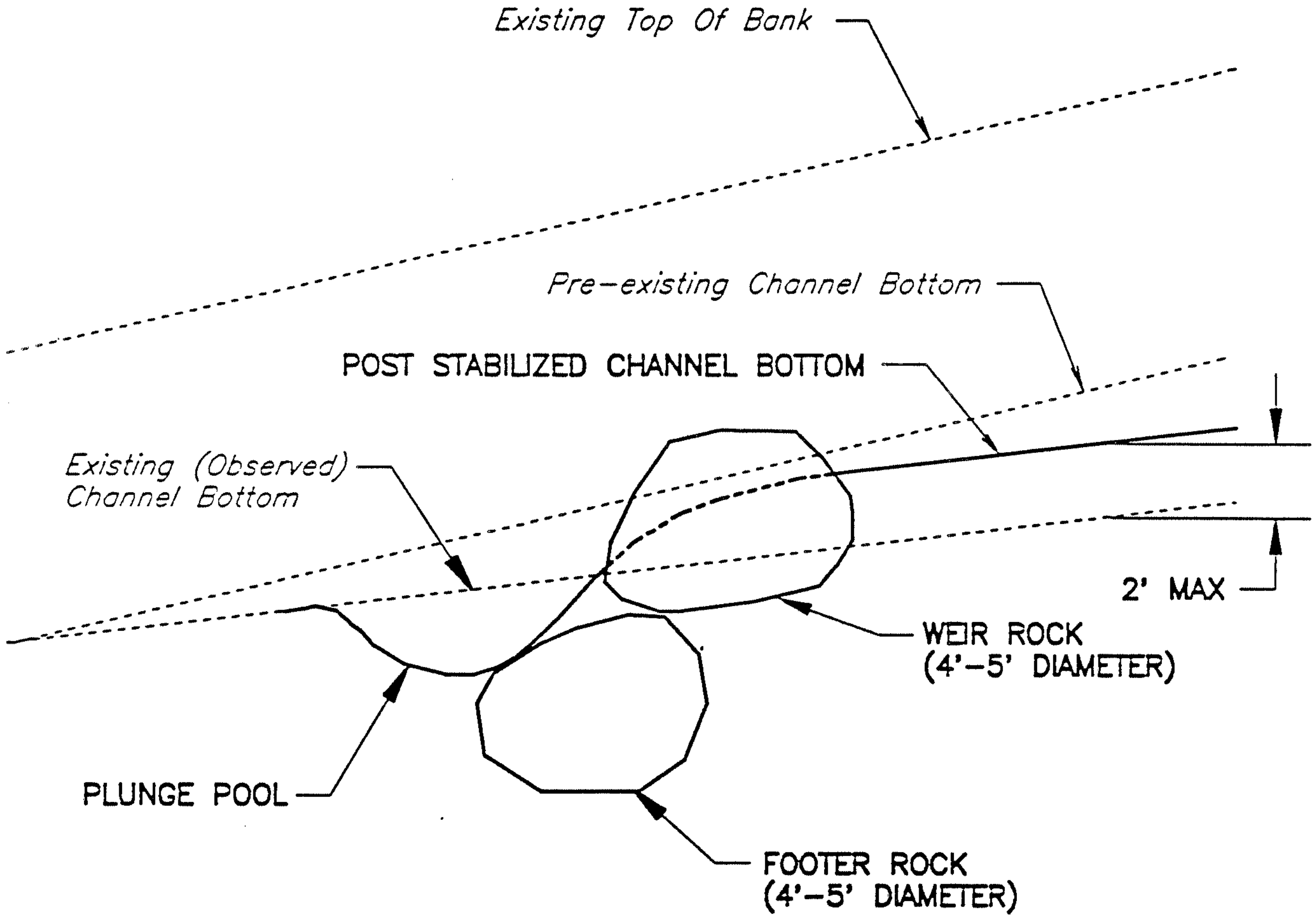
[1] fps = feet per second


Existing Top Of Bank
Pre-existing Channel Bottom
POST STABILIZED CHANNEL BOTTOM
Existing (Observed) Channel Bottom
2' MAX
WEIR ROCK (4'-5' DIAMETER)
PLUNGE POOL
FOOTER ROCK (4'-5' DIAMETER)

PROFILE

FIGURE **3.33**
VORTEX ROCK WEIR PROFILE

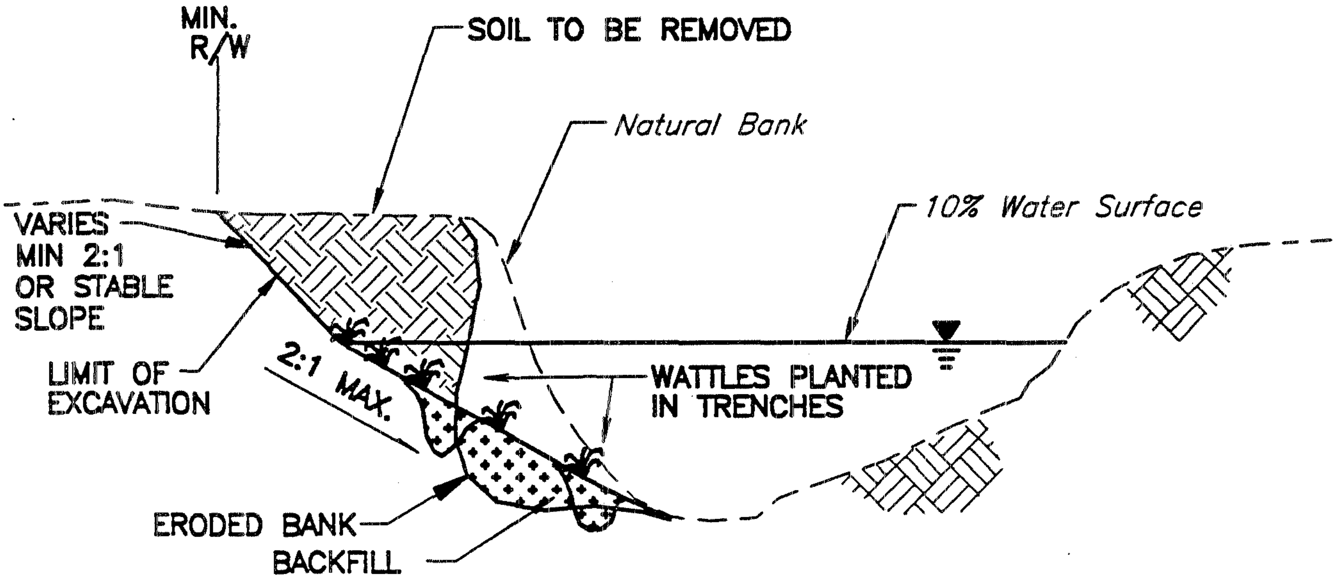


FIGURE **3.34**
CONTOUR WATTLING

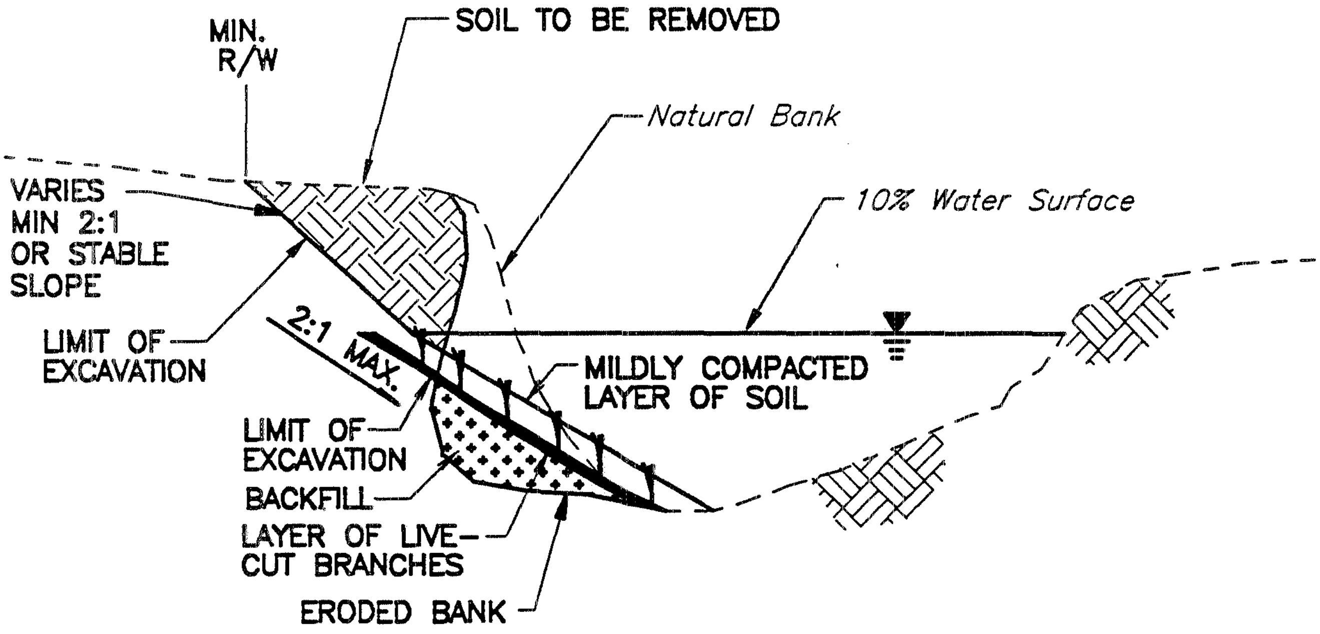


FIGURE **3.35**
BRUSH LAYERING

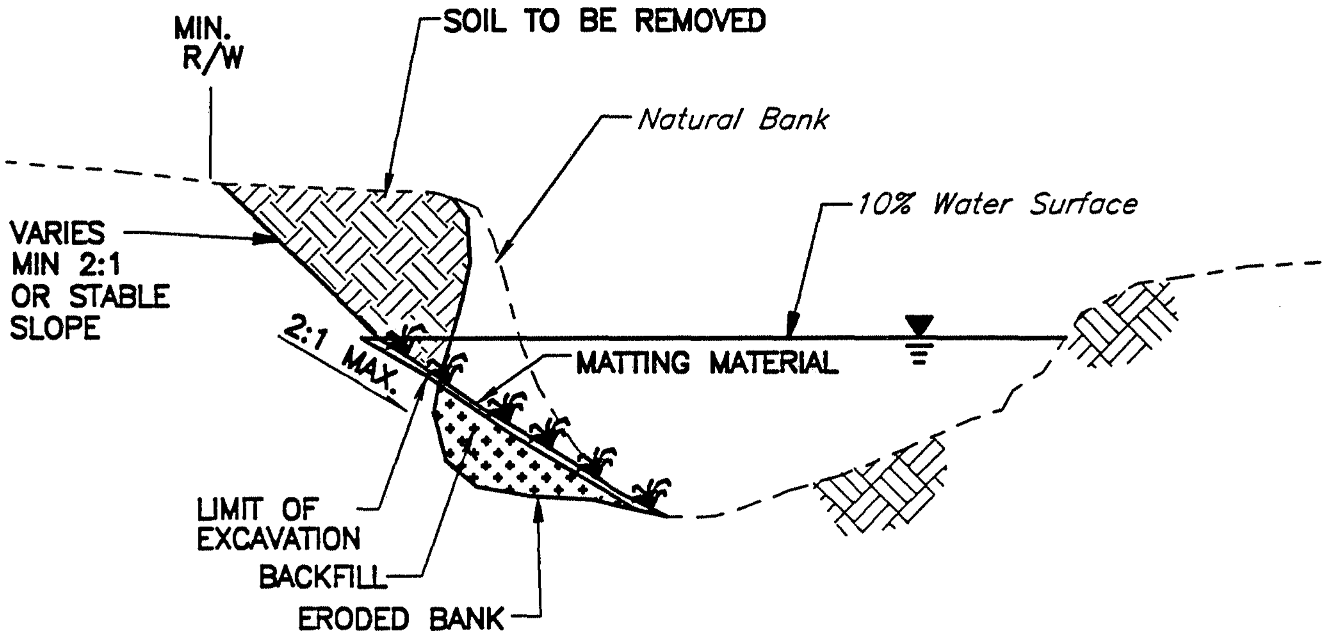


FIGURE **3.36**
BANK SURFACE MATTING

Biotechnical Slope Protection

Biotechnical Slope Protection combines live vegetation with inert material to control erosion. Any inert structure that is porous or has openings can lend itself to Mixed Construction by planting some type of vegetation on it. Methods in this category include root wads and boulders, soil cellular confinement system, rock riprap, gabions, articulated concrete blocks, and cribwalls.

—Root Wads and Boulders

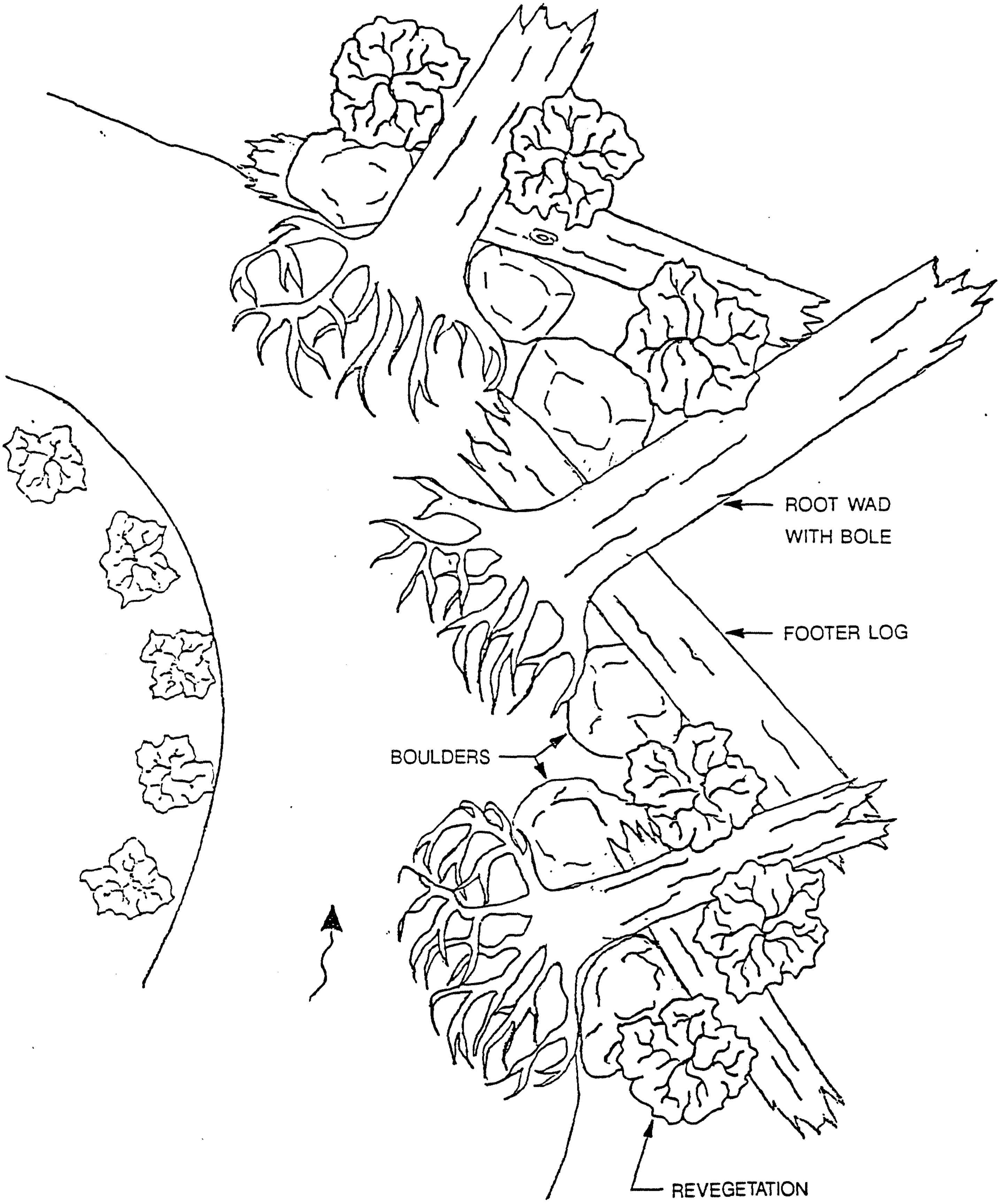
The root wads and boulders repair method consists of placing tree root wads and interspersed boulders in eroding bends of the creek (Figures 3.37 and 3.38). The root wads are placed pointing into the flow direction and the boulders (4 to 5 feet in diameter) are placed in between the wads to hold them in place and set the spacing between them. In addition to the boulders, a log called a footer log is used to support the root wad from below and another log is placed over the rood wad to hold it from above. The root wads used will have a minimum of 10 feet of tree trunk or bole still attached to the root. This tree trunk adds stability to the repair. After the root wads, boulders, and supporting logs are put in place, soil is placed on top, sloped bank, and live staked.

This method has a drawback in that about 20 feet of depth is needed for installation. When installed correctly, this method can be applied where expected velocities are within normal ranges. The longevity of this method is also governed by the type of trees that are used and the amount of time during the year that they are wet.

—Soil Cellular Confinement System (Geocell)

Soil cellular confinement system or geocell is a polyethylene plastic cellular system where structural strength is developed by a composite design of soil, plant roots, and the plastic cellular configuration (see Figure 3.39). This system is available in 8-inch deep honeycomb mats that are 32 to 96 inches wide and in 8-foot lengths. This structure functions similar to a cribwall structure. It is installed in offset vertical layers to create plantable terraces. The honeycomb terrace cells are filled with soil, moderately compacted and planted with woody and herbaceous vegetation to augment structural qualities.

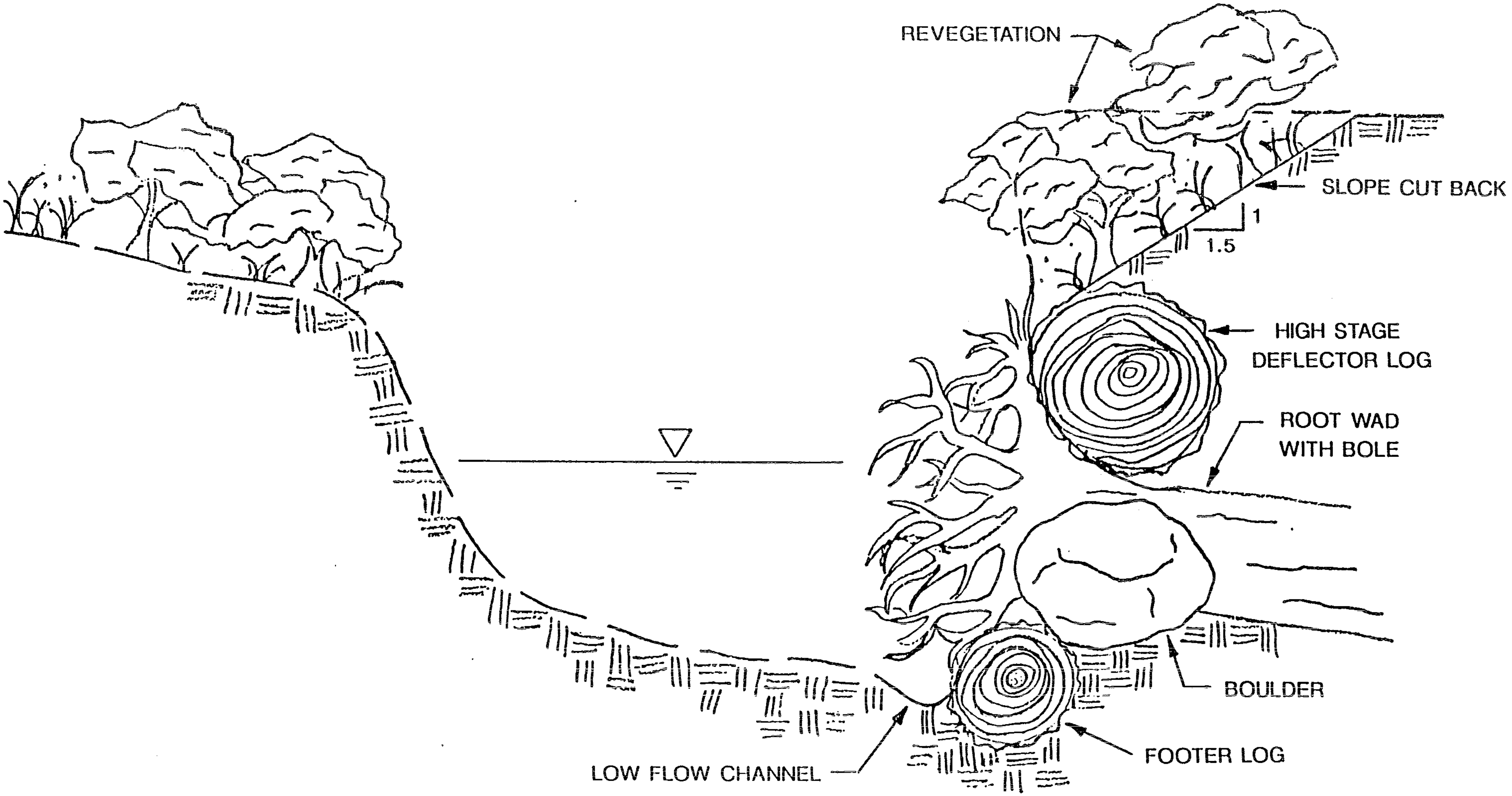
This application is suitable for slopes flatter than 2:1 to steep slopes up to 1/2:1 and with flow velocities up to and exceeding 6 feet per second. However, the revegetation potential of this method is not as good as Live Construction or Soil Bioengineering methods.



ROOT WADS AND BOULDERS

PLAN VIEW

FIGURE 3.37



ROOT WADS AND BOULDERS
TYPICAL CROSS SECTION

FIGURE 3.38

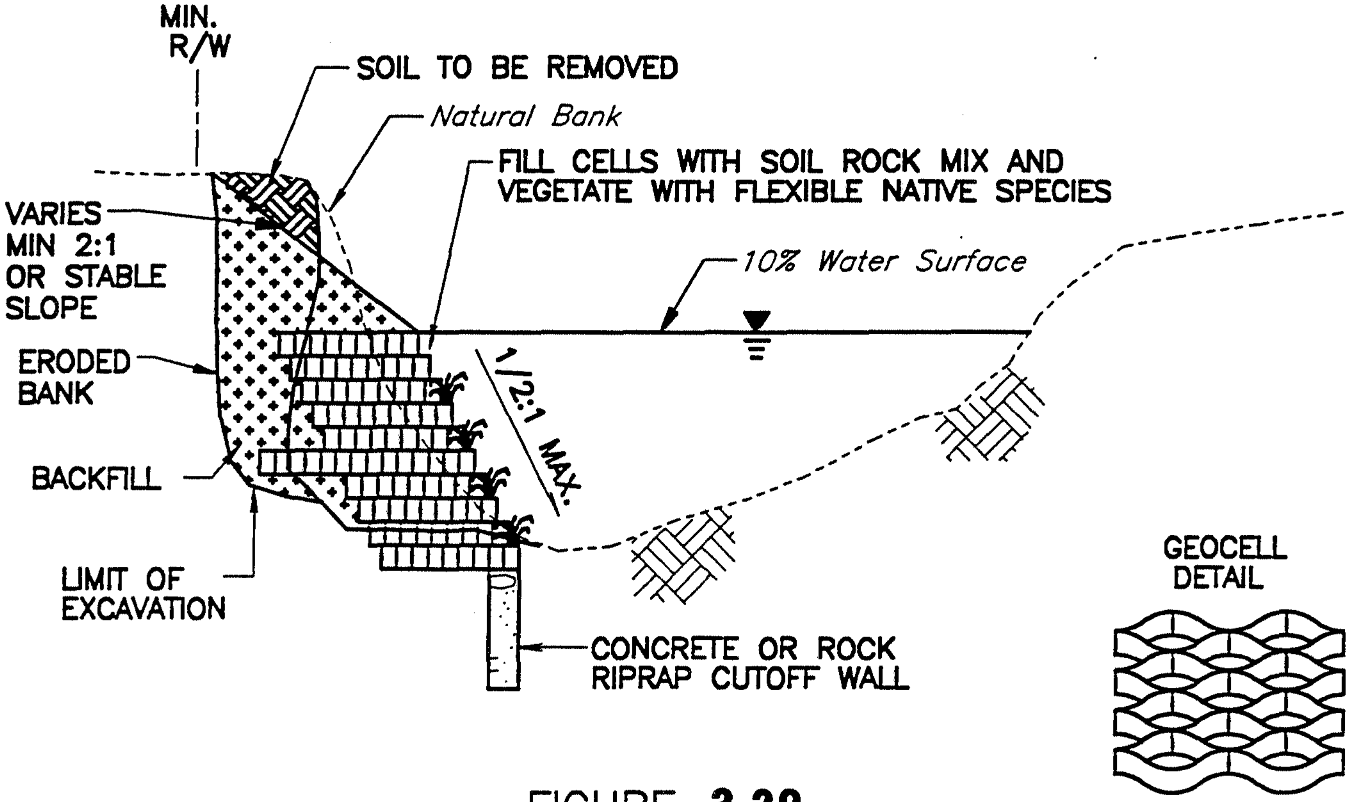

MIN.
R/W
SOIL TO BE REMOVED
Natural Bank
FILL CELLS WITH SOIL ROCK MIX AND VEGETATE WITH FLEXIBLE NATIVE SPECIES
VARIES MIN 2:1 OR STABLE SLOPE
10% Water Surface
ERODED BANK
1/2:1 MAX.
BACKFILL
LIMIT OF EXCAVATION
GEOCELL DETAIL
CONCRETE OR ROCK RIPRAP CUTOFF WALL

FIGURE **3.39**
SOIL CELLULAR CONFINEMENT SYSTEM (GEOCELL)

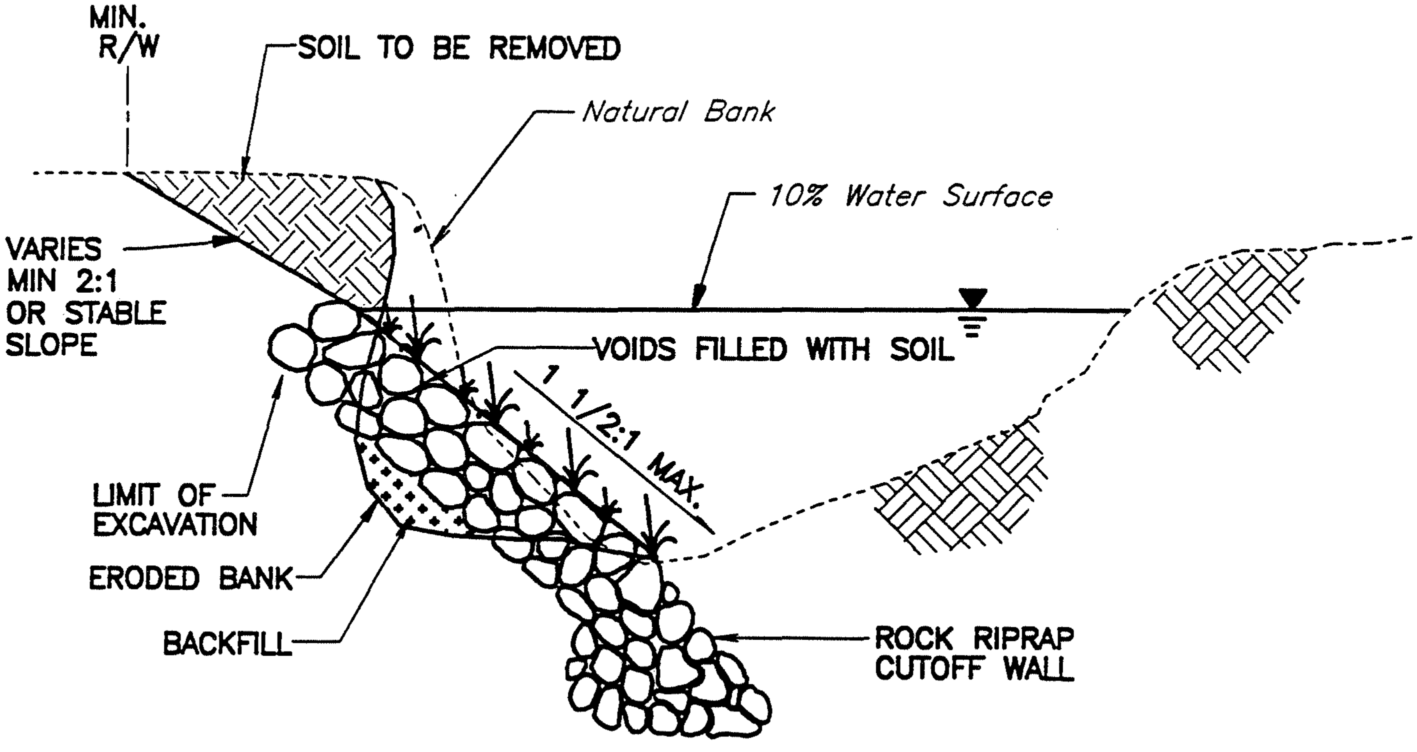


FIGURE **3.40**
ROCK RIPRAP

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—Rock Riprap

Rock riprap consists of placing rock rip rap on the bank slope to eliminate erosion at the toe and on the bank of the slope (see Figure 3.40). Rock sizes can vary from 6 inches to 4 feet in diameter. The rocks selected should be large and uniform enough, so soil can be placed between the rocks and planted by live staking or direct seeding (joint planting).

This application is suitable for bank slopes up to 1.5:1 and flow velocities up to 15 feet per second. Rock riprap provides some opportunity for revegetation but slightly less than soil cellular confinement system.

—Gabions

Gabions consist of wire baskets filled with 6-inch diameter rocks that are placed on scoured banks either as sloping mattresses or stacked in layers that resemble steps (see Figure 3.41). This material requires a concrete, gabion, or rock cutoff wall if no other invert protection is provided. Designs can accommodate revegetation goals and maintain bank moisture through ground water migration or surface infiltration. Gabions can be revegetated by leaving pockets without gabions open to bare soil that can be planted with trees or shrubs (see Figure 3.42).

Their application is suitable for bank slopes varying from flatter than 3:1 to as steep as 3/4:1 and flow velocities up to 15 feet per second. Gabions have revegetation potential but less than rock riprap.

—Articulated Concrete Mat

ACM consist of concrete interlocking blocks that are cabled together to form mats that can be laid on the channel slope or channel invert (see Figure 3.43). A cutoff wall made of either concrete or ACM is necessary to anchor ACM to the channel. ACM can be open or closed cells. The open cell style has similar benefits to geocell in that moisture migrates through the cells, and herbaceous plants can be revegetated in the cell openings by live stacking or direct seeding (reinforced grass).

Their application is suitable for bank slopes up to 1:1 and flow velocities up to 15 feet per second. The revegetation potential is limited by the size of the cell opening. The closed cell style allows for little migration of water and revegetation but provides stronger support under high flow velocity conditions.

—Cribwalls

Cribwalls consist of stacked interlocking concrete cells that form a retaining wall (see Figure 3.44). The composite design employs the strength of a concrete frame together with compacted backfill. Cribwalls can be vegetated with grasses and herbaceous plants in the openings between the cells by live staking.

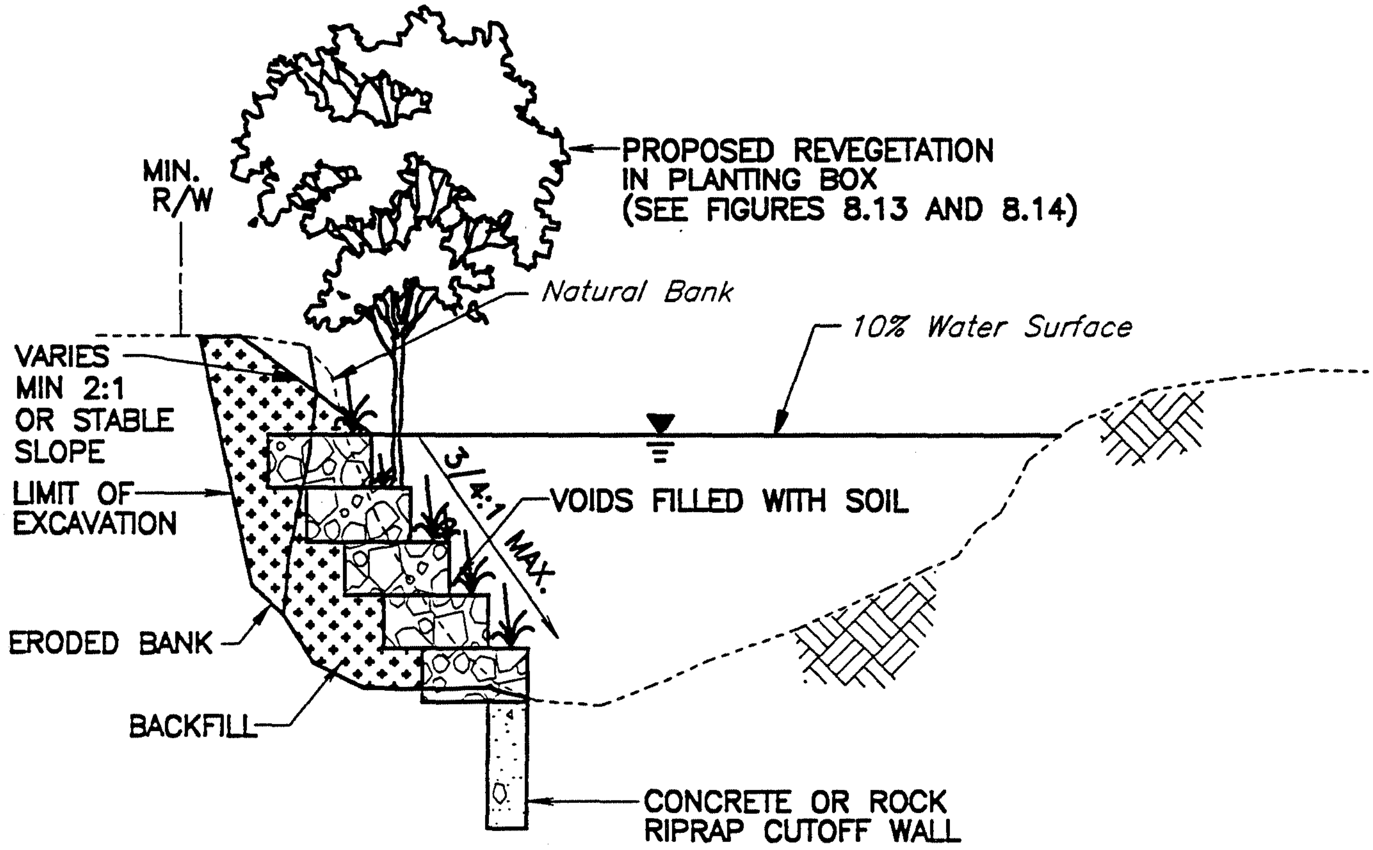
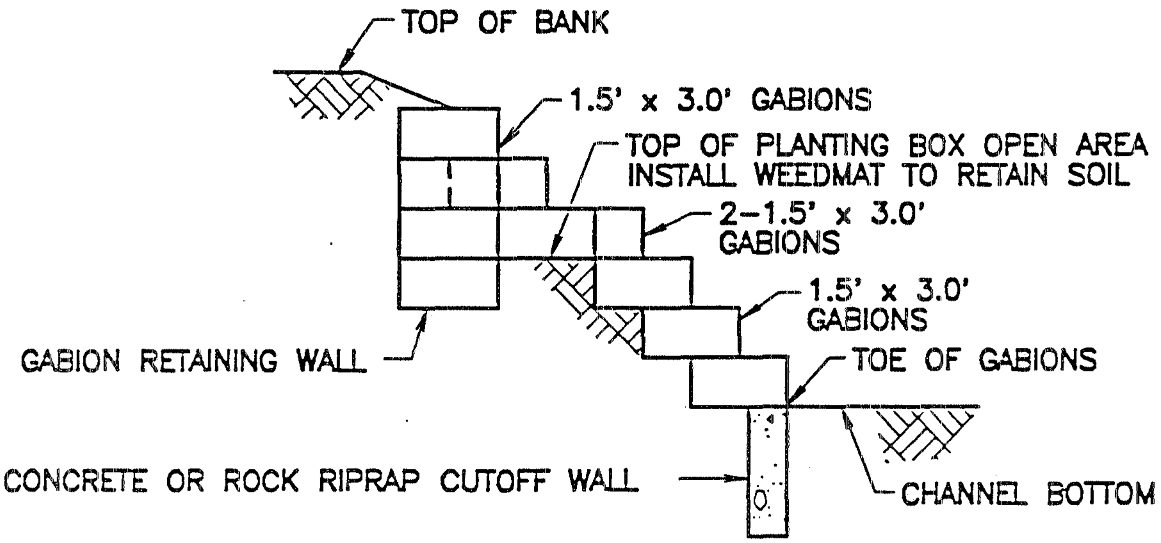

MIN. R/W
PROPOSED REVEGETATION IN PLANTING BOX (SEE FIGURES 8.13 AND 8.14)
Natural Bank
10% Water Surface
VARIES MIN 2:1 OR STABLE SLOPE
LIMIT OF EXCAVATION
3/4:1 MAX.
VOIDS FILLED WITH SOIL
ERODED BANK
BACKFILL
CONCRETE OR ROCK RIPRAP CUTOFF WALL

FIGURE **3.41**
GABIONS



GABION PLANTING BOX SECTION
NTS

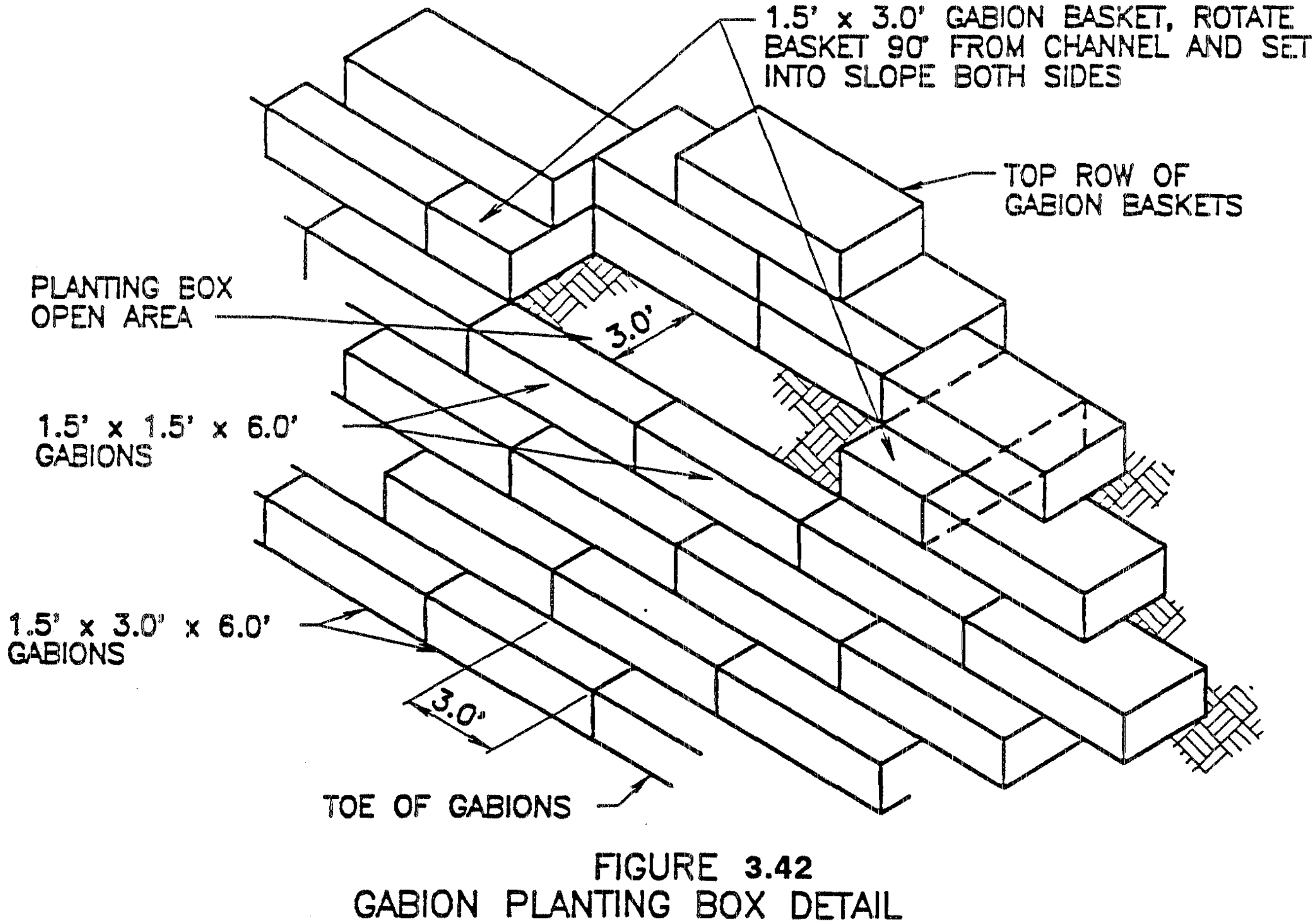

1.5' x 3.0' GABION BASKET, ROTATE BASKET 90° FROM CHANNEL AND SET INTO SLOPE BOTH SIDES
TOP ROW OF GABION BASKETS
PLANTING BOX OPEN AREA
3.0'
1.5' x 1.5' x 6.0' GABIONS
1.5' x 3.0' x 6.0' GABIONS
3.0'
TOE OF GABIONS

FIGURE 3.42
GABION PLANTING BOX DETAIL
NTS

Cribwalls can be sloped up to 1/4:1 and can withstand flow velocities up to 15 feet per second. Like articulated concrete block, cribwalls restrict plant growth by the size of the panel opening, and therefore revegetation is limited.

Inert Construction

Inert Construction consists of using only inert materials to protect an eroding channel bank. This type of construction has been widely used in the past due to its predictable properties, ease of installation, availability, and familiarity. These materials have no revegetation potential and will only be applied after both Live Construction and Mixed Construction are deemed not feasible. Methods included in this category include SCSP and gunite.

Sacked Concrete Slope Protection

SCSP consists of burlap bags filled with concrete and placed over filled eroded creek banks (see Figure 3.45). SCSP can be placed at near vertical bank slopes (1/2:1). It requires a concrete or sacked cutoff wall at the toe of the bank. SCSP can withstand flow velocities up to 15 feet per second but does not provide a plantable substrate. However, it can be contoured to avoid trees and create planting wells.

SCSP will only be used where velocities are in excess of 10 feet per second, where there is limited right of way, and where the eroded bank is near vertical.

Gunite

Gunite is an air blown sand cement mixture placed directly on eroded creek banks (see Figure 3.46). It eliminates plantable substrate but can be contoured to avoid existing trees and create planting wells. This application is suitable for near vertical bank slopes and flow velocities up to 15 feet per second.

Like SCSP, gunite will only be used where there is limited right of way and where the eroded bank is near vertical.

Vortex rock weirs will also be installed as a remedial slope protection measure if channel degradation is causing bank erosion or if channel degradation threatens existing channel structures, existing erosion protection, or adjacent private improvements. Vortex rock weir materials will be rock riprap as described in the Preventative Slope Protection section (see Figures 3.30 and 3.31). Vortex rock weir construction will be considered as an alternative to bank slope protection or employed, were needed, in conjunction with slope protection.

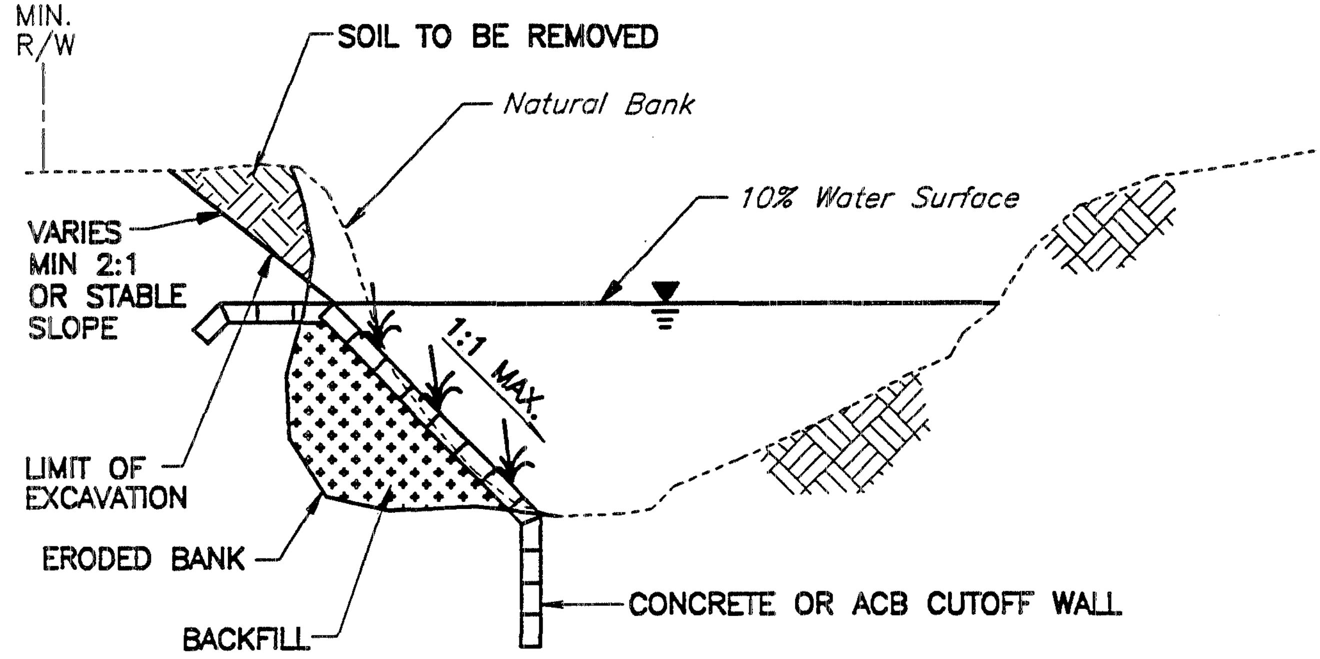


FIGURE **3.43**
ARTICULATED CONCRETE **MAT (ACM)**

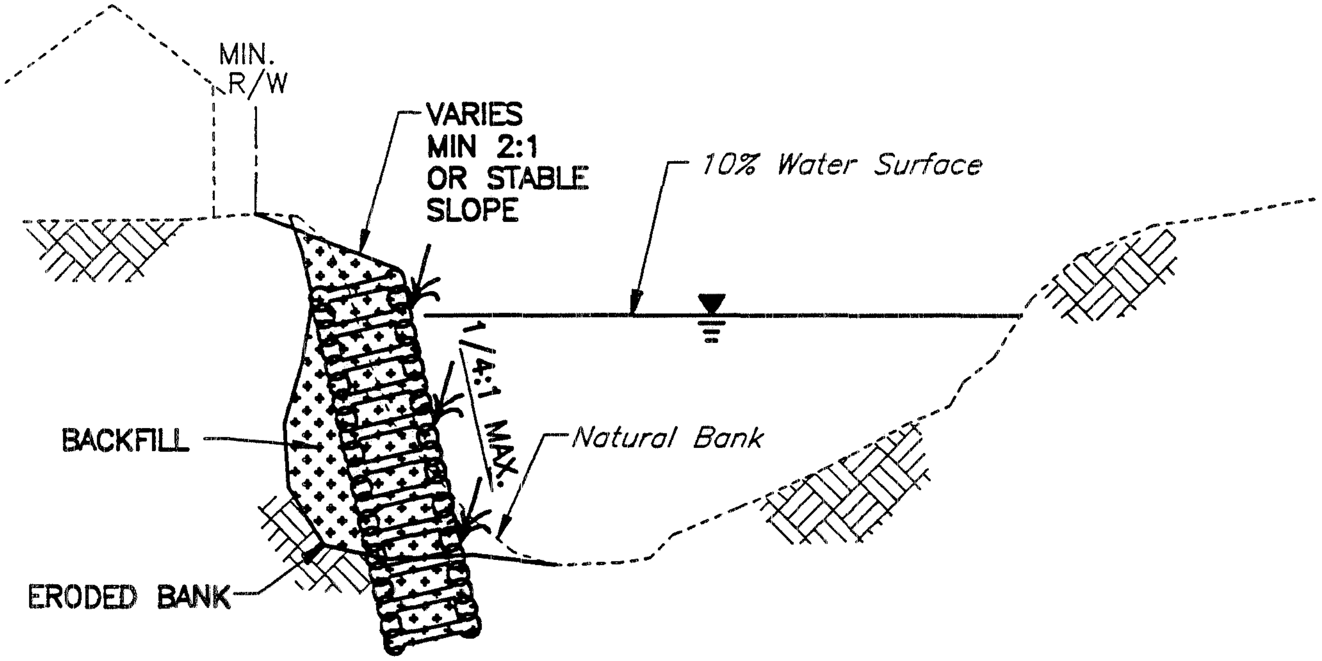


FIGURE **3.44**
CRIBWALLS

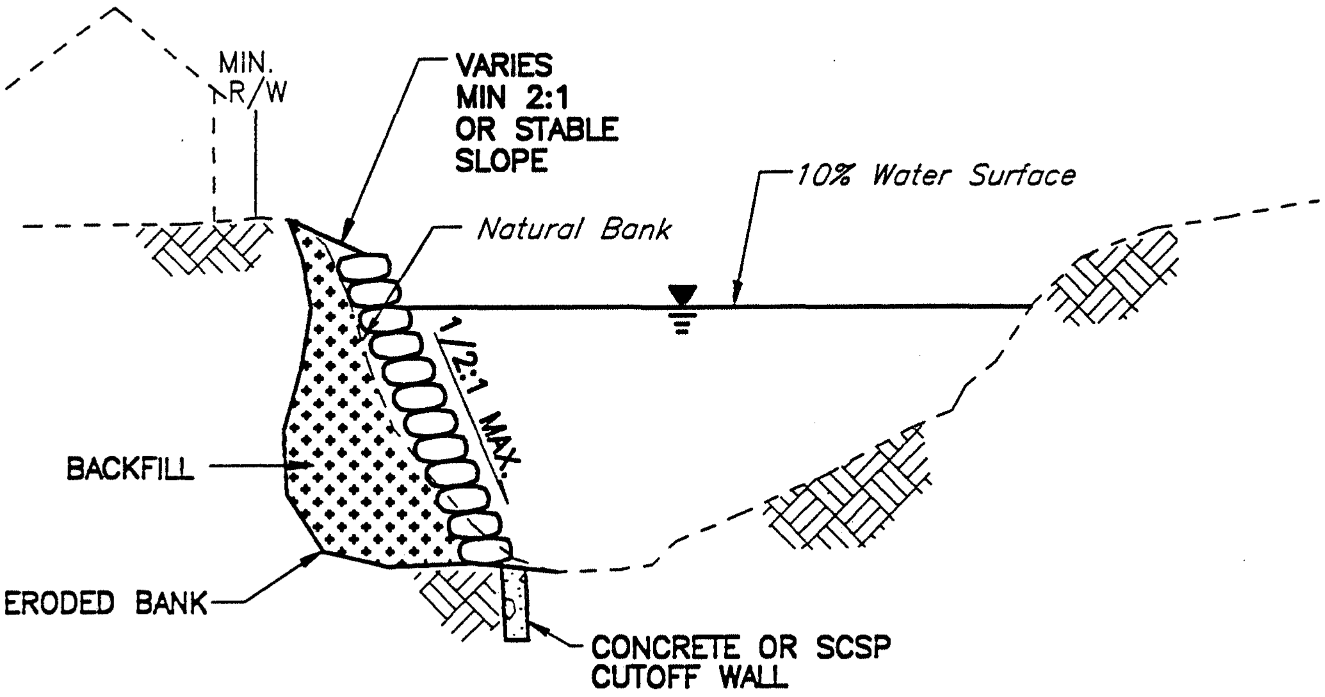


FIGURE **3.45**
SACKED CONCRETE

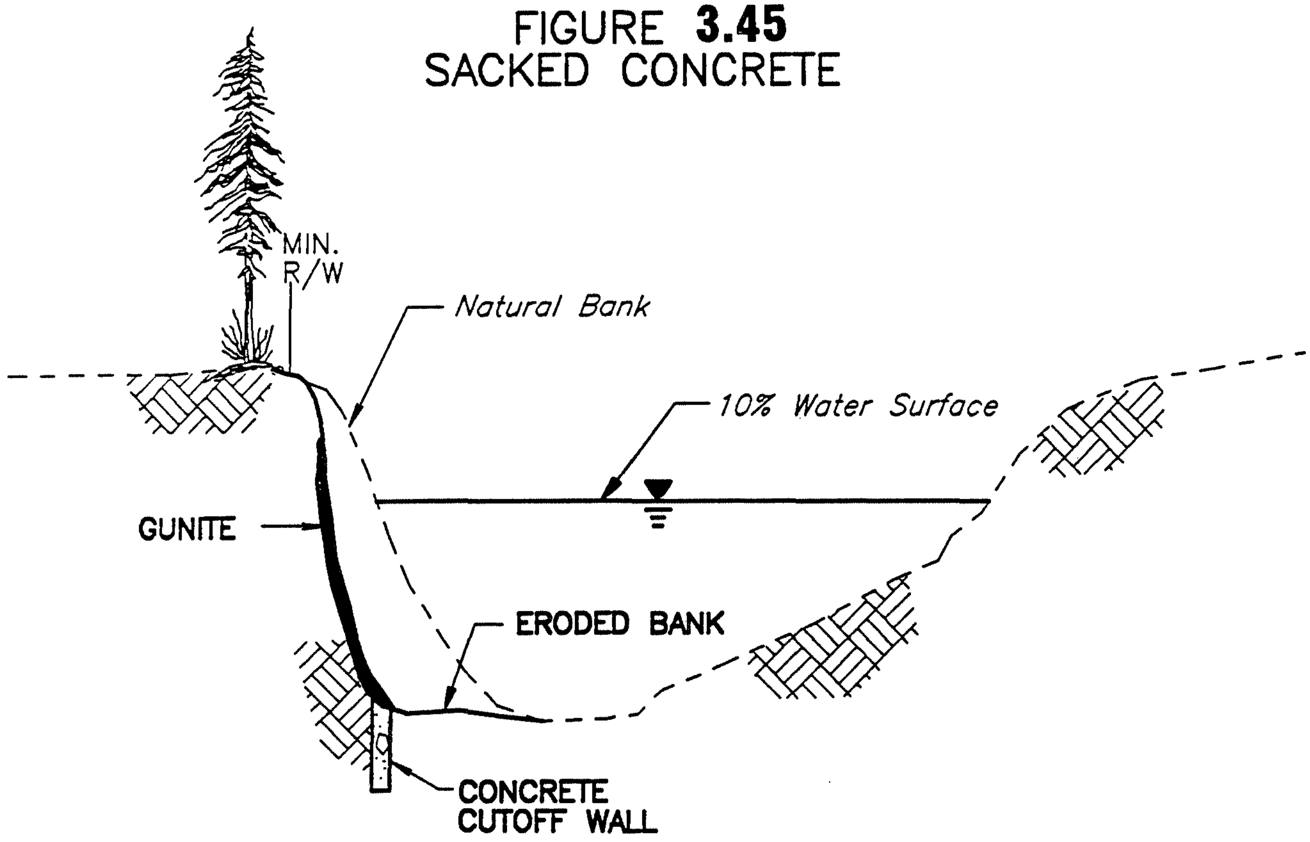


FIGURE **3.46**
GUNITE

When possible, slope protection will be installed without excavating into the existing eroding bank. Slope protection will match the upstream and downstream channel section by reestablishing the pre-erosion downstream. Proposed slope protection will be placed up to the 10-year flood flow elevation unless it is done as a preventative measure. Slope protection can be placed above the 10-year flood flow elevation if the site conditions or right of way limitation warrant it. An example of this situation would be a house located at the top of the creek bank. The protection height determination would be done on a case-by-case basis by maintenance personnel.

If the desired slope protection method exceeds the space creacted by the bank erosion, two possible approaches can be applied: (1) excavate into the existing bank, or (2) move the center of the channel further away from the eroding bank.

1. A 2:1 slope will be excavated back from the top of the slope protection where the District has ample right of way and no valuable native vegetation will be impacted (Figure 3.47). This procedure will establish a stable slope above the 10-year flood flow and will allow the District to replant native vegetation on the upper bank.

   A slope will not be excavated from the top of the slope protection where there is either insufficient right of way, structures, or valuable native vegetation would be impacted (Figure 3.48). This approach protects the lower bank from further erosion, but allows the upper bank to find it's own stable condition naturally without disturbing the existing condition.

2. If a point bar has developed in the bank opposite the eroded bank, another alternative could be to excavate the point bar and reestablish a channel alignment that is closer to the opposite bank (Figure 3.49). Available right of way and existing vegetation would need to be evaluated for this approach also.

In any case, the channel bottom will **not** be narrowed beyond the upstream and downstream conditions. Narrowing the channel could cause channel bottom degradation, downstream erosion, and upstream increased water surface. If neither of the two above alternatives can be applied, another slope protection method will be considered.

Bank protection needs to be designed for each specific site. Examples of details that should be designed are (but not limited to): size of rock, thickness of rock, depth and configuration of gabions, depth of gabion cutoff wall, and geocell anchor system.

Erosion protection measures protect for a finite period of time before deteriorating. Therefore, the District will repair existing erosion protection as necessary. If existing erosion protection completely fails, the District will reevaluate the site for alternative methods of protection before reconstruction.

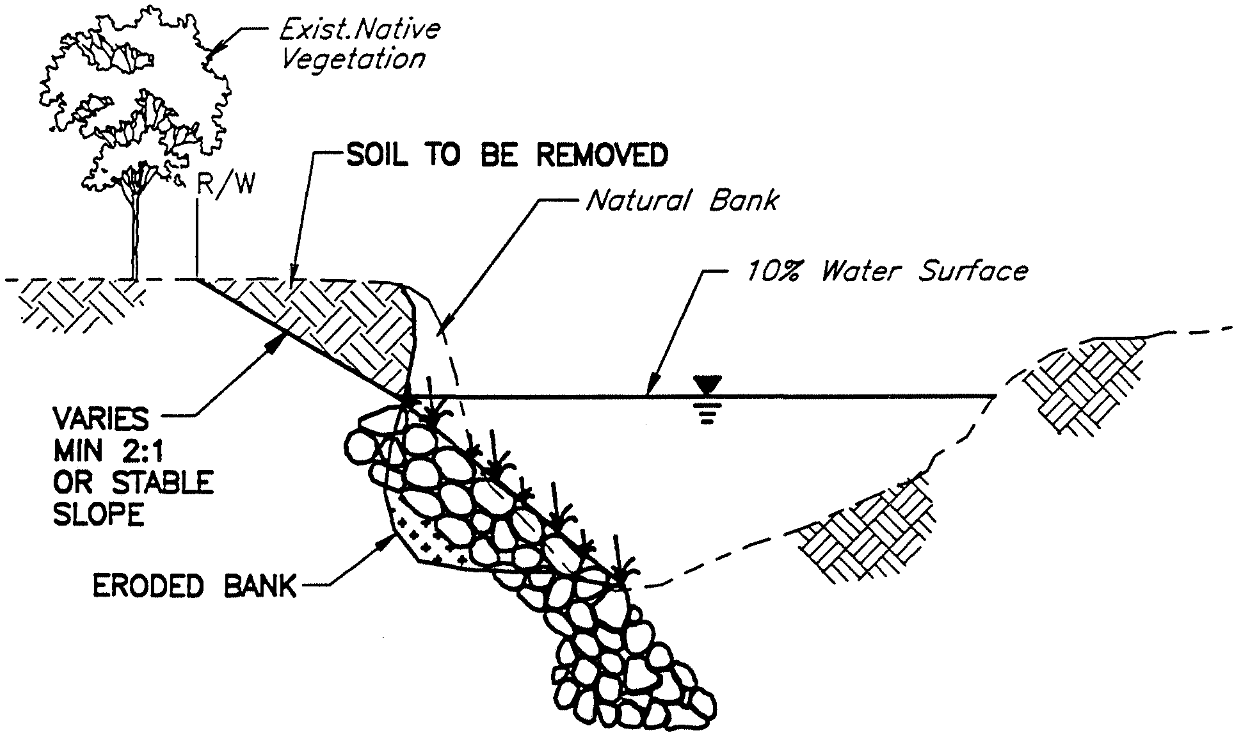


FIGURE **3.47**
SLOPE CUTBACK
(ROCK RIPRAP AS EXAMPLE OF REMEDIAL SLOPE PROTECTION)

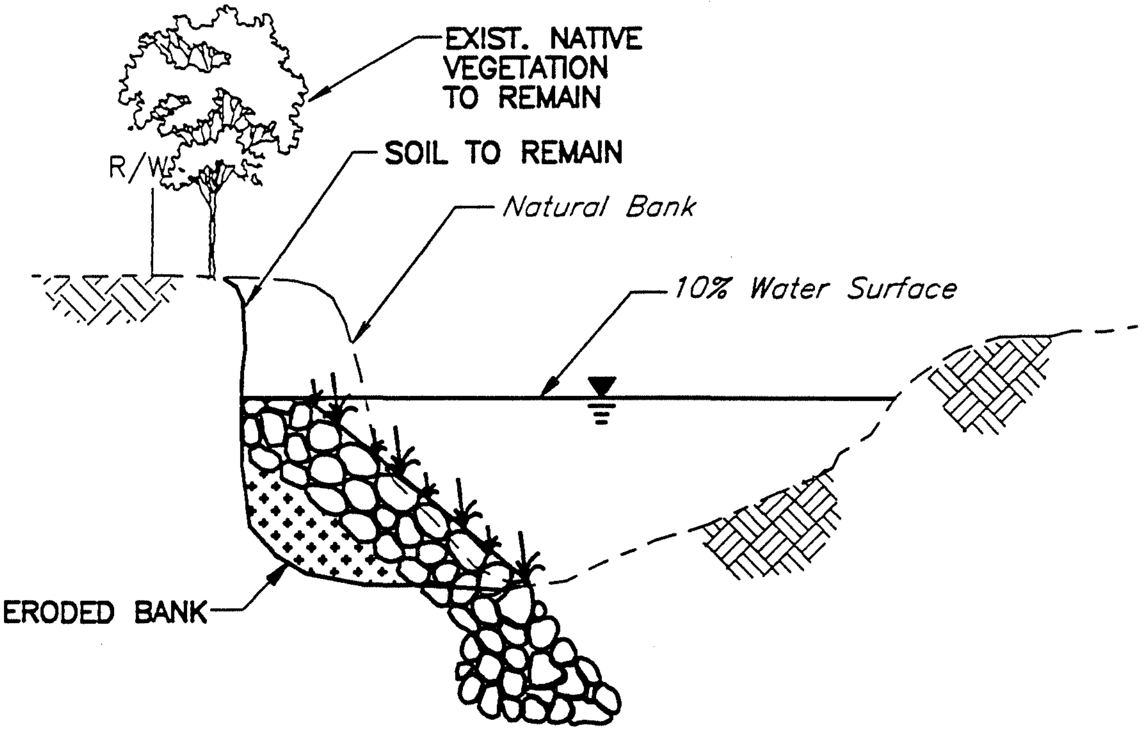


FIGURE **3.48**
NO SLOPE CUTBACK
(ROCK RIPRAP AS EXAMPLE OF REMEDIAL SLOPE PROTECTION)

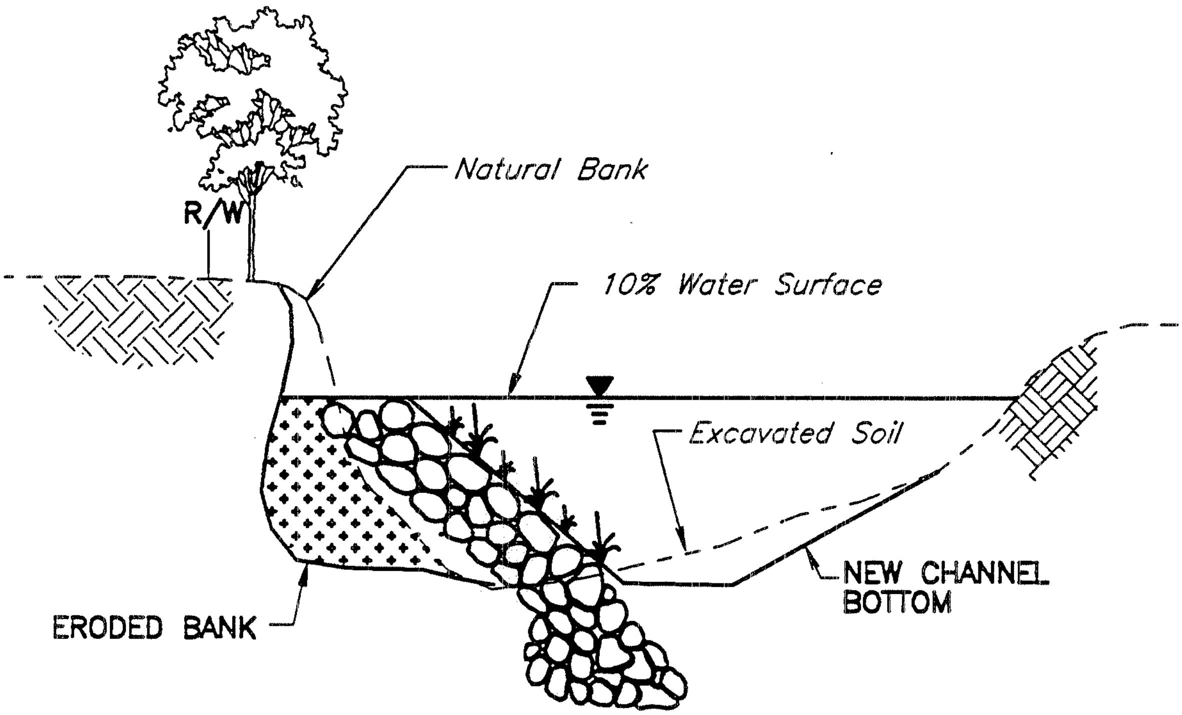


FIGURE 3.49
CHANNEL BOTTOM REALIGNMENT
(ROCK RIPRAP AS EXAMPLE OF REMEDIAL SLOPE PROTECTION)

Maintenance Program for Vegetation and Sediment Removal

Reach A: Highway 101—Interstate 880

The maintenance activities on the channel banks would include removal of dead or fallen trees, and control of nonnative habitat using herbicides. No woody vegetation removal is required on the banks. At areas designated for revegetation, the maintenance activities would be hand removal and control of nonnative habitat using herbicides. Removal of woody vegetation and sediment in the channel bottom would be as described in the Maintenance Standards, Table 3.21. Maintenance roads would be sprayed with pre-emergent and post-emergent herbicides annually.

Reaches 6, 7, 8: Interstate 280—Willow Glen Way

The maintenance activities on the natural creek banks would include removal of dead or fallen trees, and control of nonnative habitat using herbicides. No woody vegetation removal is required on the banks. Removal of woody vegetation in the channel bottom would be as described in the Maintenance Standards, Table 3.21.

The maintenance activities in the bypass channel would include repair of damaged gabion baskets, control of nonnative habitat using herbicides, and removal of trash and debris. Removal of woody vegetation in the channel bottom would also be necessary when the height exceeds 10 feet. Sediment removal would be as described in the Maintenance Standards, Table 3.21. Maintenance roads would be sprayed with preemergent and postemergent herbicides annually. At areas designated for revegetation, the maintenance activities would be hand removal and control of nonnative habitat using herbicides.

The confluence and diversion structures in Reaches 6 and 9, respectively, would be inspected annually for damages and repaired as necessary. All trash or debris accumulated at the entrance of the structures would be removed.

Reaches 9 and 10A: Willow Glen Way—Canoas Creek

The maintenance activities on the west bank would consist of removal of dead or fallen trees, and control of nonnative plants using herbicides. Cribwalls on the east bank would be inspected and repaired as necessary. No woody vegetation removal is required on either bank. Removal of sediment and woody vegetation in the channel bottom would be as described in the Maintenance Standards, Table 3.21.

Woody vegetation in the floodway would be removed when the height exceeds 10 feet. The maintenance activities on the revegetation areas would be hand removal and control of nonnative habitat using herbicides. Maintenance road would be sprayed with preemergent and postemergent herbicides annually. The maintenance program for the two short bypasses in Reach 9 would be the same as for Reaches 6, 7, and 8.

Reach 10B: Canoas Creek—Stream Gage 23B

The maintenance activities on the east bank would include removal of dead or fallen trees, and control of nonnative habitat using herbicides. Existing gabion baskets on the west bank would be inspected and repaired as necessary. No woody vegetation removal is required on either bank. Removal of sediment and woody vegetation in the channel bottom would be as described in the Maintenance Standards, Table 3.21.

The levee and maintenance roads would be sprayed with preemergent and postemergent herbicides annually. At areas designated for revegetation, the maintenance activities would be hand removal and control of nonnative habitat using herbicides. Woody vegetation in the floodway would be removed when the height exceeds 10 feet.

Reach 10C: Stream Gage No. 23—Capitol Expressway

From Gage Station 23B to Hillsdale Avenue, the maintenance activities would consist of removal of dead or fallen trees, and control of nonnative habitat using herbicides. No woody vegetation removal is required on the channel banks. Woody growth in the designated floodway would be removed when the height exceeds 10 feet. At areas designated for revegetation, the maintenance activities would be hand removal and control of nonnative habitat using herbicides. The depressed maintenance road would be sprayed with preemergent and postemergent herbicides annually. Upstream of Hillsdale Avenue to Capitol Expressway, the maintenance activities would be control of nonnative habitat using herbicides. Gabion baskets and cribwalls would be inspected and repaired as necessary.

Removal of sediment and woody vegetation in the channel bottom would be as described in the Maintenance Standards, Table 3.21.

Reach 11: Capitol Expressway—Branham Lane

From Capitol Expressway to Branham Lane, the maintenance activities would consist of removal of dead or fallen trees, and control of nonnative habitat using herbicides. No woody vegetation removal is required on the channel banks. Gabion baskets and cribwalls would be inspected and repaired as necessary. The maintenance program for the 700-foot long bypass in this reach would be the same as for Reaches 6, 7, and 8. From 1,500 feet upstream of Capitol Expressway to the SJWC property, the maintenance activities on the east bank would be control of nonnative habitat using herbicides. At areas designated for revegetation, the maintenance activities would be hand removal and control of nonnative habitat using herbicides. Maintenance roads would be sprayed with preemergent and postemergent herbicides annually. Removal of sediment and woody vegetation in the channel bottom would be as described in the Maintenance Standards, in Table 3.21.

Reach 12: Branham Lane—Blossom Hill Road

The maintenance activities would consist of removal of dead or fallen trees, and control of nonnative habitat using herbicides. No woody vegetation removal is required on the channel banks. Removal of sediment and woody vegetation in the channel bottom would be as described in the Maintenance Standards, Table 3.21. At areas designated for revegetation, the maintenance activities would be hand removal and control of nonnative habitat using herbicides. Maintenance roads and levees would be sprayed with preemergent and postemergent herbicides annually.

Canoas Creek: Guadalupe River—End of Nightingale Drive

The maintenance activities would consist of trash and debris removal, and control of woody vegetation using herbicides. Removal of sediment in the channel bottom would be as described in the Maintenance Standards, Table 3.21. Box culverts under Almaden Expressway and Nightingale Drive would be inspected and any sediment accumulation would be removed as necessary. The maintenance road would be sprayed with preemergent and postemergent herbicides annually. Any vegetation overhanging into the maintenance road from adjacent properties would be pruned.

Ross Creek: Guadalupe River—Jarvis Avenue

The maintenance activities would consist of trash and debris removal, and control of woody vegetation. Removal of sediment in the channel bottom would be as described in the Maintenance Standards, Table 3.21. Box culverts under Almaden Expressway, Cherry Avenue and Jarvis Avenue would be inspected and any sediment accumulation would be removed when exceeding acceptable maintenance limit. ACM lining would also be inspected and repaired as necessary. Maintenance road would be sprayed with preemergent and postemergent herbicides annually. Any vegetation overhanging into the maintenance road from the adjacent properties would be pruned.

Maintenance Standards

The flow area of the proposed flood control channel would require periodic clearing. Maximum levels of vegetation and sediment which can be allowed within the flow area without jeopardizing the 100-year flood flow capacity have been identified during the hydraulic design. These maximum levels are called acceptable maintenance limits and are listed in Table 3.21.

TABLE 3.20
Summary of Remedial Slope Protection Methods

Erosion Control Technique				
Category	**Method**	**Slope Requirements**	**Flow Velocity Requirements**	**Additional Information**
Live construction	Planting grasses, cuttings, transplants, live staking, seeding	2:1 or flatter	4 fps[1] or less	Not feasible on Guadalupe River due to excessive channel velocities.
Mixed construction—soil bioengineering	Contour wattling	2:1 or flatter	6 fps or less	Plant roots protect soil. Creates benches or terraces to create flat areas. Limited use on Guadalupe River due to high creek velocities.
	Brush layering	2:1 or flatter	6 fps or less	Similar uses and restrictions to contour wattling.
	Bank surface matting	2:1 or flatter	6 fps or less	May be combined with live staking or direct seeding. Similar uses and restrictions to contour wattling.
Mixed construction—biotechnical slope protection	Root wads and boulders	Varies	6 fps or less	For use on the outside of eroding bends. 20 feet of horizontal depth is needed for installation.
	Soil cellular confinement system (structural design)	½:1 or flatter	6 fps or less	Cells are filled with soil and planted with vegetation. Matrix is not biodegradable.
	Rock riprap	1½:1 or flatter	15 fps or less	May be used for preventative as well as remedial protection. May be combined with live staking or direct seeding.
	Gabions	¾:1 or flatter	15 fps or less	Can be planted but vegetation potential is limited.
	Articulated concrete mat	1:1 or flatter	15 fps or less	Can be planted with live staking or direct seeding. Plant growth is restricted to size of cell openings.
	Crib walls	¼:1 or flatter	15 fps or less	Crib walls restrict plant growth due to size of openings. Vegetation improves stability.
Inert construction	Sacked concrete slope protection	½:1 or flatter	15 fps or less	No revegetation potential.
	Gunite	All slopes to vertical	15 fps or less	No revegetation potential.

[1] fps = feet per second

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road

Reach A: Highway 101 to I-880

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Existing Excavated Channel	Channel Invert	Uniform Sediment (Highway 101 to Future Skyport Drive)	Sediment 4′ below depressed maintenance road on east bank, i.e., 3′ sediment depth	Remove sediment from toe to toe.
		Uniform Sediment (Future Skyport Drive to I-880)	Sediment 9′ below depressed revegetation bench, i.e., 1′ sediment depth	Remove sediment from toe to toe.
		Local Sediment (bars, sloughs, etc.)	No limit	No maintenance required.
		Woody Vegetation (Willows, Cottonwoods, Bamboo, etc.)	Height of tallest vegetation outside a 50′ wide corridor exceeds 10′. No woody vegetation within the 50′ corridor.	In conjunction with herbicide program, remove or cut vegetation outside of the 25′ corridor to height of 1′ or less and chemical treatment of large stumps (except existing standing trees with trunk diameter greater than 6″ shall remain).
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies entire invert	After herbicides treatment, remove all brush from toe to toe.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Revegetation Areas	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Maintenance Roads and Ramps	Vegetation on Roads	No vegetation on roads	Spray preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

Reaches 6, 7, and 8: I-280 to Willow Glen Way

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Existing Natural Channel	Channel Invert	Woody Vegetation (Willows, Cottonwoods, bamboo, etc.)	Height of tallest vegetation outside a 25′ wide corridor exceeds 10′. No woody vegetation within the 25′ corridor.	In conjunction with herbicides program, remove or cut vegetation outside of the 25′ wide corridor to height of 1′ or less and chemical treatment of larger stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies **entire** invert	After herbicides treatment, remove all brush from 25′ wide corridor.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
Gabion Bypass Channel	Channel Invert	Streambed Scour	Expose 2′ of cutoff wall	Place rock, restore bed.
		Uniform Sediment	Sediment above first gabion course (1.5′)	Remove sediment.
		Local Sediment (bars, sloughs, etc.)	Sediment above second gabion course (3.0′)	Remove sediment.
		Woody Vegetation (Willows, Cottonwoods, Bamboo, etc.)	Height of tallest vegetation exceeds 10′	In conjunction with herbicides program, remove or cut vegetation on invert to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies **entire** invert	After herbicides treatment, remove all brush from toe to toe.
	East and West Banks	Vegetation	Control of nonnative species	Control of nonnative species with herbicides and hand removal. Dead or fallen trees, and trash would be removed.
	Revegetation Areas	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Maintenance Roads and Ramps	Vegetation on Roads	No vegetation on roads	Spray preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

Reaches 9 and 10A : Willow Glen Way to Almaden Expressway (Southbound)

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Widened Cribwall Channel	Channel Invert	Uniform Sediment (Willow Glen Way to Willow Glen Way Island)	Sediment 6′ below depressed maintenance road on east bank, i.e., 3′ sediment depth	Remove sediment from 25′ wide corridor.
		Uniform Sediment (Upstream of Willow Glen Way Island to Malone Road)	Sediment 3′ below depressed maintenance road , i.e., 3′ sediment depth	Remove sediment from 25′ wide corridor.
		Uniform Sediment (Malone Road to Malone Road Island)	Sediment 2′ below depressed maintenance road on east bank, i.e., 3′ sediment depth	Remove sediment from 25′ wide corridor.
		Uniform Sediment (Upstream of Malone Road Island to Almaden Expressway Southbound)	Sediment 2′ below depressed maintenance road on east bank, i.e., 3′ sediment depth	Remove sediment from 25′ wide corridor.
		Local Sediment (bars, sloughs,etc.)	No limit	No maintenance required.
		Woody Vegetation (Willows, Cottonwoods, bamboo, etc.)	Height of tallest vegetation outside a 25′ wide corridor exceeds 10′. No woody vegetation within the 25′ corridor.	In conjunction with herbicides program, remove or cut vegetation outside of the 25′ wide corridor on invert to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies **entire** invert	After herbicides treatment, remove all brush from 25′ wide corridor.
	Floodway	Local Scour	Expose 2′ of cutoff wall	Place rock, restore bed.
		Woody Vegetation (Willows, Cottonwoods, etc.)	Height of tallest vegetation exceeds 10′	In conjunction with herbicides program, remove or cut vegetation on floodway to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies **entire** floodway	After herbicides treatment, remove all brush on floodway.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Depressed Maintenance Road and Ramps	Vegetation on Road	No vegetation on road	Spray preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Gabion Bypass Channels (Upstream of Willow Glen Way and Malone Road)	Channel Invert	Streambed Scour Woody Vegetation (Willows, Cottonwoods, etc.) Flexible Vegetation (brush, vines, etc.)	Expose 2′ of cutoff wall Height of tallest vegetation exceeds 10′ Vegetation occupies entire invert	Place rock, restore bed. In conjunction with herbicides program, remove or cut vegetation on invert to height of 1′ or less and chemical treatment of large stumps. After herbicides treatment, remove all brush on invert.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Revegetation Areas	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
Undisturbed Natural Channels (Upstream of Willow Glen Way and Malone Road)	Channel Invert	Woody Vegetation (Willows, Cottonwoods, bamboo, etc.) Flexible Vegetation (brush, vines, etc.)	Height of tallest vegetation within a 25′ wide designated corridor exceeds 10′ Vegetation occupies entire invert	In conjunction with herbicides program, remove or cut a 25′ wide corridor through vegetation on invert to height of 1′ or less and chemical treatment of large stumps. After herbicides treatment, remove all brush from 25′ wide corridor.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

Reach 10B: Almaden Expressway (Southbound) to Gage Station 23B

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Existing Gabion Lined Channel	Channel Invert	Streambed Scour	Expose 2′ of cutoff wall	Place rock, restore bed.
		Uniform Sediment (Almaden Expressway Southbound to Northbound)	Sediment above first gabion course (1.5′)	Remove sediment from invert.
		Uniform Sediment (Almaden Expressway Northbound to Gage Station 23B)	No limit	No maintenance required.
		Local Sediment (bars, sloughs, etc.)	No limit	No maintenance required.
		Woody Vegetation (Willows, Cottonwoods, bamboo, etc.)—Almaden Expressway Southbound to Northbound	Height of tallest vegetation outside a 25′ wide corridor exceeds 10′. No woody vegetation within the 25′ corridor.	In conjunction with herbicides program, remove or cut vegetation outside the 25′ wide corridor on invert to height of 1′ or less and chemical treatment of large stumps.
		Woody Vegetation (Willows, Cottonwoods, bamboo, etc.)—Almaden Expressway Northbound to Gage Station 23B	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
		Flexible Vegetation (brush, vines, etc.)—Almaden Expressway Southbound to Northbound	Vegetation occupies **entire** invert	After herbicides treatment, remove all brush from 25′ wide corridor.
		Flexible Vegetation (brush, vines, etc.)—Almaden Expressway Northbound to Gage Station 23B	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Floodway	Woody Vegetation (Willows, Cottonwoods, etc.)	Height of tallest vegetation exceeds 10′	In conjunction with herbicides program, remove or cut vegetation on floodway to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies **entire** floodway	After herbicides treatment, remove all brush on floodway.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Revegetation Areas	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Depressed Maintenance Road, Ramps and Road on Levee	Vegetation on Road	No vegetation on road	Sprayed preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

Reach 10C: Gage Station 23B to Capitol Expressway

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Widened Gabion Channel	Channel Invert	Woody Vegetation (Willows, Cottonwoods, bamboo, etc.)	Height of tallest vegetation outside a 25′ wide corridor exceeds 10′. No woody vegetation within the 25′corridor.	In conjunction with herbicides program, remove or cut vegetation outside of 25′ wide corridor on invert to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies entire invert	After herbicides treatment, remove all brush from 25′ wide corridor.
	Floodway	Local Scour	Expose 2′ of cutoff wall	Place rock, restore bed.
		Woody Vegetation (Willows, Cottonwoods, etc.)	Height of tallest vegetation exceeds 10′	In conjunction with herbicides program, remove or cut vegetation on floodway to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies entire floodway	After herbicides treatment, remove all brush on floodway.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Revegetation Areas	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Depressed Maintenance Road and Ramps	Vegetation on Road	No vegetation on road	Spray preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

Reach 11: Capitol Expressway to Branham Lane

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Widened Gabion Channel	Channel Invert	Streambed Scour	Expose 2′ of cutoff wall	Place rock, restore bed.
		Uniform Sediment (Capitol Expressway to San Jose Water Co. property)	Sediment above second gabion course (3.0′)	Remove sediment from 25′ wide corridor.
		Uniform Sediment (San Jose Water Co. property to Ross Creek confluence)	Sediment at same elevation as depressed revegetation bench on west bank, i.e., 3′ sediment depth	Remove sediment from 25′ wide corridor.
		Uniform Sediment (Ross Creek confluence to Branham Lane)	Sediment 3′ below depressed maintenance road on west bank, i.e., 3′ sediment depth	Remove sediment from 25′ wide corridor.
		Local Sediment (bars, sloughs, etc.)	No limit	No maintenance required.
		Woody Vegetation (willows, Cottonwoods, bamboo, etc.)	Height of tallest vegetation outside a 25′ wide corridor exceeds 10′. No woody vegetation within the 25′ corridor.	In conjunction with herbicides program, remove or cut vegetation outside of the 25′ wide corridor on invert to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies **entire** invert	After herbicides treatment, remove all brush from 25′ wide corridor.
	Floodway (Ross Creek Confluence to Branham Lane)	Woody Vegetation (Willows, Cottonwoods, etc.)	Height of tallest vegetation exceeds 10′	In conjunction with herbicides program, remove or cut vegetation on floodway to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies **entire** floodway	After herbicides treatment, remove all brush on floodway.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
	Revegetation Areas	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Depressed Maintenance Roads and Ramps	Vegetation on Roads	No vegetation on roads	Sprayed preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.
Gabion Bypass Channel (Upstream of Capitol Expressway)	Channel Invert	Streambed Scour	Expose 2′ of cutoff wall	Place rock, restore bed.
		Woody Vegetation (Willows, Cottonwoods, etc.)	Height of tallest vegetation exceeds 10′	In conjunction with herbicides program, remove or cut vegetation on invert to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies entire invert	After herbicides treatment, remove all brush on invert.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Revegetation Areas	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

Reach 12: Branham Lane to Blossom Hill Road

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Existing Natural Channel	Channel Invert	Uniform Sediment—Branham Lane to Branham Lane Dam	Sediment 4′ below depressed maintenance road on east bank, i.e., 3′ sediment depth	Remove sediment from invert.
		Uniform Sediment—Branham Lane Dam to Chynoweth Avenue	Sediment 9′ below depressed maintenance road on east bank, i.e., 3′ sediment depth	Remove sediment from invert.
		Uniform Sediment—Chynoweth Avenue to Blossom Hill Dam	Sediment 4′ below depressed maintenance road on east bank, i.e., 3′ sediment depth	Remove sediment from invert.
		Uniform Sediment—Blossom Hill Dam to Blossom Hill Road	Sediment 12′ below depressed maintenance road on east bank, i.e., 3′ sediment depth	Remove sediment from invert.
		Local Sediment (bars, sloughs, etc.)	No limit	No maintenance required.
		Woody Vegetation (Willows, Cottonwoods, etc.)	Height of tallest vegetation outside a 25′ wide corridor exceeds 10′. No woody vegetation within the 25′ corridor.	In conjunction with herbicides program, remove or cut vegetation outside of the 25′ wide corridor on invert to height of 1′ or less and chemical treatment of large stumps.
		Flexible Vegetation (brush, vines, etc.)	Vegetation occupies entire invert	After herbicides treatment, remove all brush from 25′ wide corridor.
	East and West Banks	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Revegetation Areas	Vegetation	Control of nonnative species	Hand removal and control of nonnative species with herbicides. Dead or fallen trees, and trash would be removed.
	Maintenance Roads and Ramps	Vegetation on Roads	No vegetation on roads	Spray preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

Canoas Creek: Almaden Expressway to End of Nightingale Drive

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Floodwalls	Channel Invert	Uniform Sediment	Sediment 1′ above invert	Remove sediment from invert.
		Local Sediment (bars, sloughs, etc.)	No limit	No maintenance required.
		Woody Vegetation	Height of tallest vegetation exceeds 5′	In conjunction with herbicides program, remove or cut vegetation on invert to height of 1′ or less and chemical treatment of large stumps.
		Brush, Vines, etc.	Vegetation occupies **entire** invert	After herbicides treatment, remove all brush from toe to toe.
	East and West Banks	Woody Vegetation	Height of tallest vegetation exceeds 5′	In conjunction with herbicides program, remove or cut vegetation on banks to height of 1′ or less and chemical treatment of large stumps.
		Brush, Vines, etc.	Vegetation occupies **entire** banks	After herbicides treatment, remove all brush on banks.
	Maintenance Road and Ramps	Vegetation on Road	No vegetation on road	Sprayed preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.

TABLE 3.21
Maintenance Standards for Sediment and Vegetation Removal
Guadalupe River—Highway 101 to I-880 and I-280 to Blossom Hill Road
(continued)

Ross Creek: Almaden Expressway to Cherry Avenue

	Facility Type	Maintenance Issue	Acceptable Maintenance Limit	Performance Criteria
Armorflex Lined Channel	Channel Invert	Uniform Sediment	Sediment 1′ above invert	Remove sediment from invert.
		Local Sediment (bars, sloughs, etc.)	No limit	No maintenance required.
		Woody Vegetation	Height of tallest vegetation exceeds 5′	In conjunction with herbicides program, remove or cut vegetation on invert to height of 1′ or less and chemical treatment of large stumps.
		Brush, Vines, etc.	Vegetation occupies **entire** invert	After herbicides treatment, remove all brush from toe to toe.
	East and West Banks	Woody Vegetation	Height of tallest vegetation exceeds 5′	In conjunction with herbicides program, remove or cut vegetation on banks to height of 1′ or less and chemical treatment of large stumps.
		Brush, Vines, etc.	Vegetation occupies **entire** banks	After herbicides treatment, remove all brush on banks.
	Maintenance Road and Ramps	Vegetation on Road	No vegetation on road	Sprayed preemergent and postemergent herbicides.
		Vegetation Overhanging	Vegetation overhanging into roadway	Cut back overhanging vegetation to edge of maintenance road up to the height of 12′.

APPENDIX C-A

CUMULATIVE IMPACT ANALYSIS METHODS

Cumulative Impacts

Appendix C-A. Cumulative Impact Analysis Method was prepared by The Habitat Restoration Group in 1990.

APPENDIX C-A

CUMULATIVE IMPACT ANALYSIS METHODS

A habitat inventory of the Guadalupe River System was performed from July to October 1990 to document the general distribution and relative abundance of riparian habitats within the Guadalupe River System. The Guadalupe River System as defined herein encompasses the Guadalupe River from the mouth to Almaden Expressway upstream of Blossom Hill Road, as well as its major tributaries: Los Gatos Creek, Canoas Creek, Ross Creek, Guadalupe Creek, Alamitos Creek, and Arroyo Calero Creek (refer to section on Cumulative Impacts, Figure 5.1). Analysis along Los Gatos Creek, Guadalupe Creek, Arroyo Calero Creek, and Los Alamitos Creek only extended upstream to their respective reservoirs. Secondary tributaries were not included in the analysis due to the difficulty in access. The inventory entailed both reconnaissance-level field surveys and interpretation of existing information. Detailed vegetation surveys were not conducted due to the general nature of the analysis.

The study involved using 1:50 scale tree inventory maps prepared for the SCVWD Guadalupe River Flood Control Project and the Guadalupe River Park Project, 1:100 scale vegetation maps prepared for the Guadalupe River flood control project, and 1:500 scale County of Santa Clara aerial maps dated June 1986. Except for Guadalupe River Reaches A and 6-12 of the SCVWD's proposed flood control project, and Zones B-F of the Guadalupe River Park Project, the river system was divided into reaches corresponding to the Santa Clara Valley Water district stations (SCVWD 1986) based on major differences in vegetation characteristics.

Habitats that occurred along the streambank (from the toe of the channel to the top of bank) measuring at least 500 feet linear distance were identified and categorized. Habitat polygons less than 500 feet linear distance were not measured as separate habitat units but combined into the measurement of the dominant habitat type within which they occurred. A few habitat types greater than 500 feet in linear distance may have been overlooked during the inventory process due to the cursory nature of the field surveys. The habitat categories included bare areas, ruderal vegetation, as well as various types of riparian vegetation (refer to section on Cumulative Impacts, Table 5.4). Although the riparian forests of the Guadalupe River System can be broadly categorized into the central coast cottonwood sycamore riparian forest habitat type (Holland ibid.), more specific categories were created to reflect observed differences in plant associations. The riparian vegetation categories were defined by the dominant overstory and understory tree species observed during the field surveys, as well as interpretation of the habitat descriptions of the reaches from the proposed Guadalupe River flood control project (see Existing Conditions) and the Draft EIR for the Guadalupe River cumulative impact analysis. Except for the revegetation project on the Guadalupe River upstream from Blossom Hill Road, all other revegetation projects were classified into riparian or non-riparian habitats, based on the criteria, above. Streambanks modified through the installation of gabion, concrete channels, rip-rap, and underground culverts were measured for linear distances because it was impractical to calculate the acreage of underground and vertical-sided channels.

The identified habitat types were measured for linear distance and average width for each bank. Habitat variables were measured directly from the 1:100 scale vegetation maps and the 1:50 scale tree inventory maps. Reconnaissance-level field surveys were necessary to distinguish stream location and/or habitat type for the other portions of the system for which only 1:500 scale aerial maps were available. Depending upon accessibility each reach was spot-checked in several places to identify the habitat type. Where practical, the habitat widths of the banks were measured in the field using a 100-foot tape; otherwise, visual estimates of habitat width were made. The width of the riparian habitat was measured from the toe of the channel to the outer drip-line. Adjusting for scale, the linear distances of the identified habitats were measured directly from the aerial maps using a curvimeter.

Acreage was calculated for each habitat category based on the actual measurements of linear distance from the aerial maps, and actual field and map measurements and estimates of habitat width. These acreage calculations were then compared to existing GIS acreage figures for corresponding reaches in the SCVWD flood control project area (Reaches A and 6-12) to derive a factor for adjusting the inventory acreage estimations to reflect the existing conditions more closely. Acreage estimates of riparian habitat derived from the cumulative impact inventory were 26 percent greater than that from the GIS calculations for Reaches A and 6-12. Thus, all cumulative impact inventory acreages were reduced 26 percent. The adjusted acreage values are approximations and used in the cumulative impact analysis as indicators of the relative abundance of the various habitat types in the Guadalupe River System, as defined by the cumulative impact study area (Figure C-1).

Although detailed information on habitat types and acreages for reaches of the SCVWD's proposed Guadalupe River flood control project area were prepared for the EIR/EIS, it was not used in the cumulative impact habitat inventory, due to the incompatible measurement techniques. Reaches of the flood control project were inventoried in a manner consistent with the methodology used for the remaining cumulative impact study area. The final results of habitat inventory are presented in the following manner.

Contribution of each habitat type for:

- the entire Guadalupe River System (Table C-A-1),
- all mainstem reaches combined (Table C-A-2),
- all tributaries combined (Table C-A-3).

Considering the generalized methods taken in qualifying and quantifying the various habitat types, as well as the project constraints outlined in the methodology above, all quantitative results of the cumulative impact analysis should be used with caution and interpreted in the broadest sense.

TABLE C-A-1

HABITAT SUMMARY GUADALUPE RIVER SYSTEM (MAINSTEM AND TRIBUTARIES)

Habitat	Linear Distances (mi)		Average Widths (ft)		Total Est. Acres		Adjusted Acres*	
	East	West	East	West	East	West	East	West
Sycamore riparian	15.5	15.5	91.2	81.6	171.6	152.8	127.0	113.1
Cottonwood/ Willow Riparian	8.6	9.3	71.6	60.5	74.6	68.2	55.2	50.5
Foothill Riparian	4.8	4.7	76.5	45.6	44.6	26.1	33.0	19.3
Mixed Riparian	0.7	0.9	40.0	37.5	3.6	4.2	2.7	3.1
Willow Riparian	0.3	0.3	49.9	49.9	2.0	2.0	1.5	1.5
Upland Landscaping	1.6	1.9	32.1	43.0	6.1	9.8	4.5	7.3
Revegetation	0.1	0.2	43.6	49.8	0.5	1.0	0.4	0.7
Ruderal	21.2	20.6	45.3	42.6	116.4	106.4	86.1	78.7
Bare	0.2	0.7	34.7	21.5	0.8	1.8	0.6	1.3

*Acreage values represent a 26 percent reduction. See Appendix C-A.

TABLE C-A-2

HABITAT SUMMARY GUADALUPE RIVER MAINSTEM

Habitat	Linear Distances (mi)		Average Widths (ft)		Total Est. Acres		Adjusted Acres*	
	East	West	East	West	East	West	East	West
Cottonwood/ Willow Riparian	7.8	8.4	69.9	61.8	66.2	63.2	49.0	46.8
Revegetation	0.1	0.2	43.6	49.8	0.5	1.0	0.4	0.7
Upland Landscaping	0.2	0.7	69.0	69.7	1.9	5.6	1.4	4.1
Ruderal	8.0	7.6	62.6	69.4	60.3	63.5	44.6	47.0
Bare	0.2	0.6	34.9	19.7	0.8	1.4	0.6	1.0

*Acreage values represent a 26 percent reduction. See Appendix C-A.

TABLE C-A-3

HABITAT SUMMARY GUADALUPE RIVER TRIBUTARIES

Habitat	Linear Distances (mi)		Average Widths (ft)		Total Est. Acres		Adjusted Acres*	
	East	West	East	West	East	West	East	West
Sycamore riparian	15.5	15.5	91.2	81.6	171.6	152.8	127.0	113.1
Cottonwood/ Willow Riparian	0.8	0.8	87.8	54.0	8.4	5.0	6.2	3.7
Foothill Riparian	4.8	4.7	76.5	45.6	44.6	26.1	33.0	19.3
Mixed Riparian	0.7	0.9	40.0	37.5	3.6	4.2	2.7	3.1
Willow Riparian	0.3	0.3	49.9	49.9	2.0	2.0	1.5	1.5
Upland Landscaping	1.3	1.2	26.1	28.3	4.2	4.2	3.1	3.1
Ruderal	13.3	13.1	34.9	27.1	56.1	42.9	41.5	31.7
Bare	0.0	0.1	0.0	31.7	0.0	0.4	0.0	0.3

*Acreage values represent a 26 percent reduction. See Appendix C-A.

APPENDIX D

SECTION 404(b)(1) ALTERNATIVES ANALYSIS

Draft

Section 404(b)(1) Alternatives Analysis for the Upper Guadalupe River Flood Control Project

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Summary

PURPOSE OF THE ANALYSIS

Section 404 of the Clean Water Act requires project proponents to obtain a permit from the U.S. Army Corps of Engineers (Corps) for activities that involve placement of dredged or fill material into waters of the United States (33 USC 1344). The Clean Water Act requires the Corps, when considering a request for a permit, to follow the requirements of the U.S. Environmental Protection Agency, Specification of Disposal Sites for Dredged or Fill Material, 40 CFR Part 230, Section 404(b)(1). For water-dependent and non-water dependent projects, the Guidelines prohibit discharges of dredged or fill material into waters of the United States if a practicable alternative to the proposed project exists that would have less adverse impacts on the aquatic ecosystem, including wetlands, and does not have other significant environmental consequences (40 Code of Federal Regulations [CFR] 230 [a]). This alternatives analysis for the Guadalupe River Flood Control Project Environmental Impact Report/Environmental Impact Statement (EIR/EIS) and other available data will provide input to facilitate the permitting decision, pursuant to EPA's Guidelines, for the Corps.

DESCRIPTION OF THE PROPOSED PROJECT

The Guadalupe River Flood Control Project is proposed by the Santa Clara Valley Water District (District) to control flooding along the Guadalupe River within the City of San Jose (Figure 1). The Guadalupe River currently cannot contain the 100-year flood or one percent flood, which is defined as the flood that has, on the average, a 1% chance of being equaled or exceeded in any given year. To increase the capacity of the Guadalupe River, channel modifications are proposed along eight sections, or reaches, of the Guadalupe River that cover approximately 6.4 miles. The project includes two discrete segments: one from Highway 101 to Interstate 880 (I-880) and another from Interstate 280 (I-280) to Blossom Hill Road. Modifications also are proposed on adjacent portions of two tributaries, Canoas Creek and Ross Creek. Channel modifications include constructing bypass channels, widening the channel, adding benches, lining portions of the channel with gabions and cribwalls, and constructing floodwalls and levees. A step-pool fish ladder would also be constructed at the 15-foot Blossom Hill drop structure.

RESULTS OF THE ALTERNATIVES ANALYSIS

A three-stage screening analysis was performed to determine the least environmentally damaging practicable alternative. Six general categories of alternatives (no-project, non-structural, upstream reservoir construction with channel modification, change of upstream reservoir operation with channel modification, off-stream storage with channel modification, and in-stream channel modifications) were analyzed during the first-stage screening of alternatives. One general category of alternatives, channel modification, was carried to the second-stage evaluation. During the second-stage screening of alternatives, three sub-alternatives (preferred project, minimize vegetation impacts (MVI), and stream restoration) within the category of in-stream channel modification were analyzed; two alternatives (preferred project and MVI) were carried forward to the third-stage screening of alternatives. The results of the third-stage screening of alternatives are presented in the draft EIR/EIS.

Wetland Impacts for Preferred Project and Minimize Vegetation Impacts Alternative

Field surveys were conducted on April 16 and 22, 1996 to verify the results of a previous field evaluation that identified waters of the United States. The following is the total amount of water of the United States in the project area: wetlands, 8.75 acres; other waters of the United States, 36.62 acres; and total jurisdictional waters, 45.37 acres. Correspondence with the Corp regarding the wetlands delineation is included in Attachment 1.

The following is a summary of pre-mitigation and post-mitigation impacts on wetlands for the Preferred Project and the MVI alternative. Table S-1 itemizes wetland impacts and mitigation by project reach.

Preferred Project

Pre-Mitigation Impacts. The Preferred Project would result in the permanent removal or temporary disturbance of approximately 1.85 acres of jurisdictional wetlands and 10.16 acres of other waters of the United States. A portion of the impact on the wetlands (not quantified) would be the result of temporary disturbance or minor grading. Narrow strips of seasonal wetland affected in many such areas are expected to reestablish naturally, because natural recovery of seasonal wetland vegetation has been observed on some banks and bars on the lower Guadalupe River. Impacts on portions of the other wetlands (particularly in Reaches A, 10B, and 12) will be permanent.

Most or all of the impacts on other waters of the United States will be temporary occurring only during construction. Following construction, ordinary high waters will occupy equal or greater areas

Figure 4-1

Project Location Map

Guadalupe River Flood Control Project

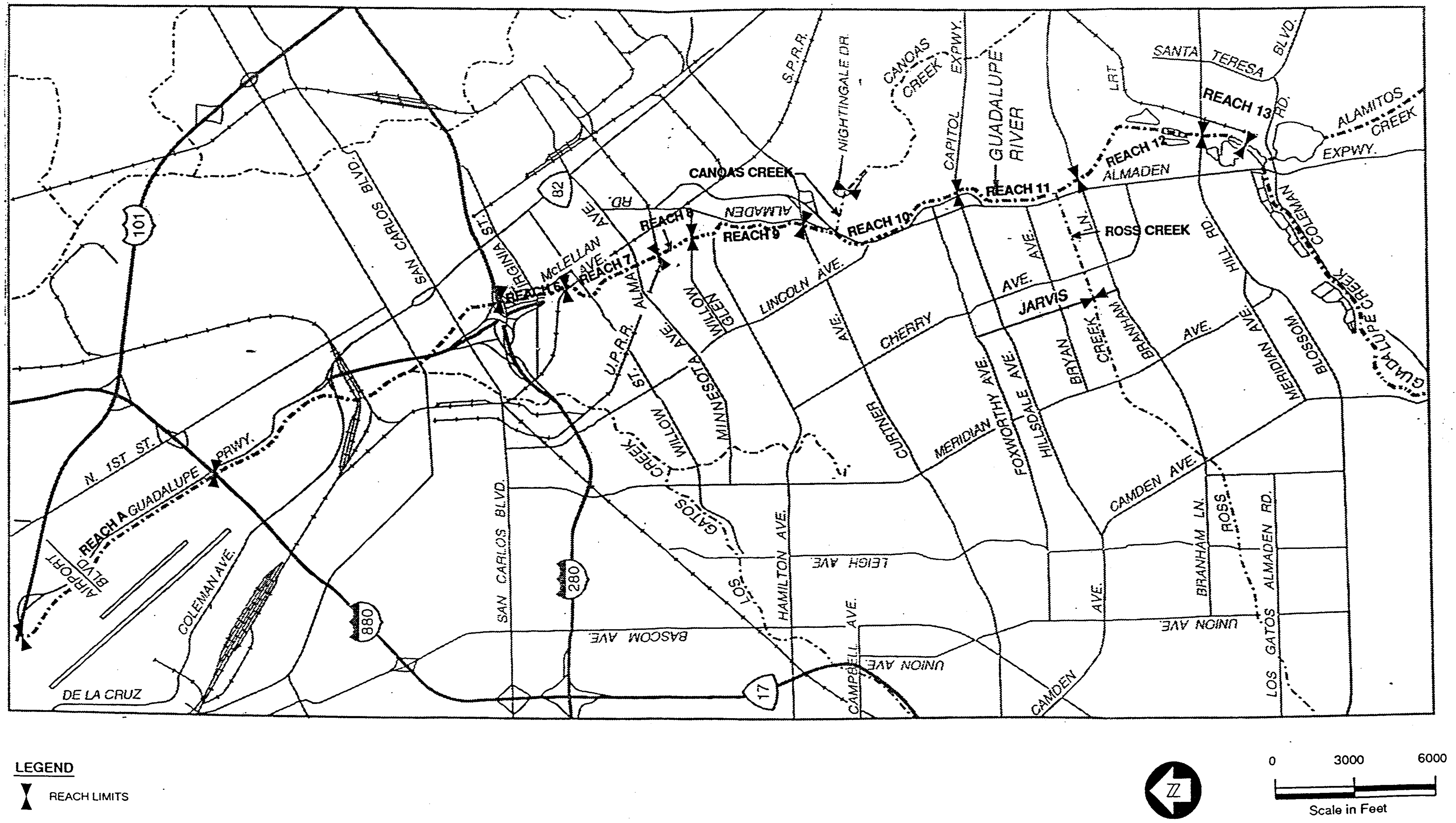

Table S-1. Net Change in Wetland Habitats for the Preferred Project and Minimize Vegetation Impact Alternative

	Jurisdictional Wetland (acres)							Other Waters of the United States (acres)						
		Preferred Project			Minimize Vegetation Impact				Preferred Project			Minimize Vegetation Impact		
Reach	Existing	Impact	Mitigation	Change	Impact	Mitigation	Change	Existing	Impact	Mitigation	Change	Impact	Mitigation	Change
A	0.69	0.80	--	-0.80	0.80	--	-0.80	0.25	0.03	0.03	--	0.03	0.03	--
6	0.19	0.00	--	-0.00	0.00	--	-0.00	2.08	0.17	0.17	--	0.17	0.17	--
7	0.03	--	--	--	--	--	--	3.88	1.82	1.82	--	1.82	1.82	--
8	0.02	--	--	--	--	--	--	1.06	0.25	0.25	--	0.25	0.25	--
9	0.06	0.02	--	-0.02	--	--	--	4.68	1.16	1.16	--	--	--	--
10A	0.18	0.03	--	-0.03	--	--	--	1.14	0.08	0.08	--	--	--	--
10B	2.34	0.28	0.52	0.25	0.28	0.52	0.25	2.67	1.25	1.25	--	1.25	1.25	--
10C	0.08	0.04	--	-0.04	0.04	--	-0.04	2.18	0.35	0.35	--	0.35	0.35	--
11A	0.15	0.10	--	-0.10	0.08	--	-0.08	2.84	0.75	0.75	--	0.08	0.08	--
11B	0.03	--	--	--	--	--	--	0.98	0.59	0.59	--	0.59	0.59	--
11C	0.02	--	--	--	--	--	--	1.18	0.35	0.35	--	0.35	0.35	--
12	1.50	0.02	1.90	1.88	0.01	1.55	1.55	9.79	0.88	0.88	--	0.27	0.27	--
13	3.02	0.16	--	-0.16	0.16	--	-0.16	1.14	0.03	0.03	--	0.03	0.03	--
Temporary Coffer Dams		--	--	--	--	--	--	--	1.06	1.06	--	1.06	1.06	--
Ross and Canoas	0.44	0.39	--	-0.39	0.39	--	-0.39	2.75	1.41	1.41	--	1.41	1.41	--
Total	8.75	1.85	2.42	0.57	1.75	2.07	0.32	36.62	10.16	10.16	--	7.64	7.64	--
Mitigation Goal (ratio)		1:1			1:1				1:1			1:1		
Minimum Mitigation Needed		1.85			1.75				10.16			7.64		
Extra Habitat Planned		0.57			0.32				--			--		
Total		2.42			2.07				10.16			7.64		

Summary for All Reaches	Jurisdictional Wetland (acres)		Other Waters of the United States (acres)	
	Preferred Project	Minimize Vegetation Impact	Preferred Project	Minimize Vegetation Impact
Total Pre-Project Habitat	8.75	8.75	36.62	36.62
Total Post-Project Habitat	9.32	9.07	36.62	36.62
Net Change (increase)	0.57	0.32	--	--

Notes:

-- = zero

Impacts on wetlands will be mitigated on at least a 1:1 basis, replacing 1.85 acres of impact (Preferred Project) with at least 1.85 acres of new wetlands of equal or greater value. Extra wetland habitat is planned in Reach 12 to provide sufficient replacement habitat, should the primary mitigation sites be less than 100% successful, or to be designated in the future as a mitigation bank.

Impacts on other waters of the United States will be mitigated on a 1:1 basis by allowing low flows and ordinary high water to occupy the same areas after project construction that they did before project construction, or to occupy an equal or greater area along a reconfigured channel that is close to the existing channel location.

in every reach and will remain in essentially their original locations (except in the middle of Reach 10B, where the low flow channel will shift slightly eastward).

Post-Mitigation Impacts. The Preferred Project would result, with the implementation of mitigation measures, in no net loss of wetlands or other jurisdictional waters of the United States. The Preferred Project would actually create additional wetland habitat beyond that required for mitigation (0.57 acre net increase). Mitigation for wetlands and other jurisdictional waters of the United States includes the following measures:

- Establish at least 1.85 acres of constructed jurisdictional wetlands to provide no net loss of wetlands within the project area, including construction of new wetlands in Reaches 10B and 12.

- Restore as much as possible of the temporarily disturbed wetlands on-site in Reach A and Reaches 6 to 13.

- Use native plant species such as grasses, sedges (*Carex* spp.), and water-plantain (*Alisma* spp.), that are flexible enough to be minimally disturbed by channel maintenance activities and minimize obstruction of flood flows.

- Use jurisdictional wetland delineation criteria as a basis for success criteria for constructed wetlands.

- Provide at least 10.16 acres of constructed and restored other waters (at least a 1:1 replacement ratio) to compensate for other waters that are either disturbed or eliminated during project construction.

Minimize Vegetation Impacts Alternative

Pre-Mitigation Impacts. The MVI alternative would result in the permanent removal or temporary disturbance of approximately 1.75 acres of jurisdictional wetlands and 7.64 acres of other waters of the United States. A portion of the wetland impact (not quantified) would be the result of temporary disturbance or minor grading. Narrow strips of seasonal wetland affected in many such areas are expected to reestablish naturally, because natural recovery of seasonal wetland vegetation has been observed on some banks and bars on the lower Guadalupe River.

Post-Mitigation Impacts. The MVI alternative would result, with the implementation of mitigation, in no net loss of jurisdictional wetlands or other waters of the United States. Mitigation for the MVI alternative would be the same as described above except that 2.07 acres (1.75 acres to compensate for the loss of jurisdictional wetlands and 0.32 acres of extra planned habitat) of jurisdictional wetlands and 7.64 acres of other waters of the United States would be created to compensate for the loss or disturbance of these habitats.

Chapter 1. Introduction

PURPOSE OF THE ANALYSIS

Section 404 of the Clean Water Act requires project proponents to obtain a permit from the U.S. Army Corps of Engineers (Corps) for activities that involve placement of dredged or fill material into waters of the United States (33 USC 1344). The Clean Water Act requires the Corps, when considering a request for a permit, to follow the requirements of the U.S. Environmental Protection Agency, Specification of Disposal Sites for Dredged or Fill Material, 40 CFR Part 230, Section 404(b)(1). For water-dependent and non-water dependent projects, the Guidelines prohibit discharges of dredged or fill material into waters of the United States if a practicable alternative to the proposed project exists that would have less adverse impacts on the aquatic ecosystem, including wetlands, and does not have other significant environmental consequences (40 CFR 230 [a]).

To secure a permit from the Corps, the project proponent must clearly demonstrate that there are no practicable, less damaging alternatives. The purpose of this report is to provide the Corps and EPA with information regarding the availability of practicable alternatives to the proposed project that are not analyzed in detail in the EIR/EIS and to summarize the analysis contained in the EIR/EIS regarding those alternatives that may be considered practicable after preliminary stages of screening. The Corps is responsible for making the formal determination of compliance with the 404 (b)(1) Guidelines. This alternatives analysis for the Guadalupe River Flood Control Project EIR/EIS and other available data will provide input to facilitate the permitting decision of the Corps.

SECTION 404 (B)(1) GUIDELINES

EPA's Guidelines (40 CFR 230 et seq.), the Corps regulatory guidelines (33 CFR 320 et seq.), and the National Environmental Policy Act (NEPA) and NEPA Guidelines (40 CFR 1500 et seq.) are the substantive environmental criteria used by the Corps to evaluate permit applications. When the Corps evaluates a request for a permit, an analysis of practicable alternatives is the primary screening mechanism used to determine the appropriateness of permitting a discharge. The Corps' evaluation also includes a public interest review and a review for NEPA compliance.

Under EPA's Guidelines, an alternative is considered practicable if it is "available and capable of being done after taking into consideration cost, existing technology, and logistics in light of the project purpose" (40 CFR 230.10 [a][2]).

If a project is not water dependent (i.e., does not require access to or siting in special aquatic sites to fulfill the basic purpose) and the project proposes a discharge into a special aquatic site, EPA's Guidelines presume that a less environmentally damaging practicable alternative exists, unless the project applicant can clearly demonstrate otherwise (40 CFR 230.10 [a][2]). Special aquatic sites include sanctuaries and refuges, wetlands, mud flats, vegetated shallows, coral reefs, and riffle and pool complexes. Thus, if a project is not water dependent and proposes to discharge dredged or fill material into a special aquatic site, the project applicant must clearly refute the regulatory presumption that a less environmentally damaging practicable alternative exists to obtain a permit for the project.

EPA's Guidelines suggest a sequential approach to project planning in which mitigation measures are considered only after the project applicant shows that no practicable alternative is available to achieve the basic purpose with less environmental impact. After it has been determined that no practicable alternative is available, EPA's Guidelines require that appropriate and practicable steps be taken to minimize potential adverse impacts on the aquatic ecosystem (40 CFR 230.10 [d]). Such steps may include actions controlling discharge location; material to be discharged, or fate of material after discharge or method of dispersion; and actions related to technology, plant and animal populations, or human use (40 CFR 230.70-230.77).

Chapter 2. Purpose of and Need for Project

PROJECT PURPOSE AND NEED

The objective of the project is to reduce flood damage by eliminating the threat of the one percent flood for the Guadalupe River.

To accomplish the flood control objective, the following additional issues are of concern:

- maintenance access,
- erosion control,
- sedimentation problems, and
- local drainage problems.

Maintenance Access

A major maintenance concern for the Guadalupe River is the lack of access to the channel. The limited access points make proper maintenance work difficult and costly. Another concern is the absence of continuous right of way. District policy will not allow performance of flood control maintenance work on facilities without a permanent right of way. A practicable alternative should provide adequate maintenance access to the Guadalupe River.

Erosion Control

Active erosion occurs due to unstable banks throughout the project area. Because of the unstable banks and unprotected trees, private properties immediately adjacent to the creek are at risk from bank failures and debris blockage. A practicable alternative should include measures to prevent active erosion due to unstable banks in the study area.

Sedimentation Problems

The most significant sedimentation problems in the Guadalupe River watershed occur between Highway 237 and Montague Expressway. The problems in this area are mainly due to the tidal currents that carry suspended silts from San Francisco Bay and deposit them in the channel. Over time, beaches are formed and vegetation eventually establishes on them. The current average annual cost of removing the sediment and vegetation is approximately $130,000 (1993 dollars). This cost likely will increase when sites near Guadalupe River are no longer available for disposal of sediment. Upstream of the tidal zone area, sediment in streams is generated primarily from active channel erosion. Some of the upstream problem areas are between Highway 101 and Interstate 880, and between Branham Lane and Blossom Hill Road. A practicable alternative should reduce and prevent significant sedimentation problems.

Local Drainage Problems

Most of the local drainage outlets in Guadalupe River are installed with flap gates to prevent reverse flow and are designed to discharge into the river by gravity. When the water levels in the Guadalupe River rise above the elevations of the drainage outlets, local runoff is prevented from entering the channel and water accumulates in the streets until the floodflows from the storm peak. A practicable alternative should include measures to reduce local drainage problems.

PUBLIC NEED FOR FLOOD CONTROL

The public need for the proposed project is to prevent a one percent (100-year) flood on the Guadalupe River that could cause the inundation of approximately 7,200 residential units, six public schools, 340 acres of commercial and industrial properties, and 114 acres of agricultural land located near the upper Guadalupe River and portions of two tributaries, Ross Creek and Canoas Creek. Additionally, the proposed project would eliminate the need for mandatory flood insurance that currently is required for areas prone to flooding during a one percent flood.

Severe flooding occurred in Santa Clara County (County) as a result of storms in January 1995. On January 9, 1995, the amount of rainfall recorded in the County ranged from 1 to 4.55 inches in 24 hours. The rainfall intensities in January were up to a 5% (20-year) return period (i.e., a flood of this magnitude has a statistical change of occurring once in every 20 years). The mayor of the City of San Jose declared a state of emergency, and the President of the United States declared Santa Clara County a federal disaster area. Estimated flood damage was $2.2 million for the County, with more than 150 homes damaged by flooding or downed trees. During this storm, mudslides and torrents of rain resulted in the closure of sections of several major highways, including SR 87, and forced evacuation of the area. Among the hardest hit areas were those flooded by the Guadalupe River.

The Guadalupe River spilled over its banks on the night of January 9, 1995, at three locations in central San Jose. During this storm, water depth in some areas reached 15 feet. The Guadalupe River forced its way into homes and pushed 50 feet along sidewalks. Water was overtopping banks, seeping through embankments, and cascading onto the roadway that had become a flood channel. Approximately 25 acre-feet (8 million gallons) of water inundated SR 87, resulting in the closure of the southbound lanes of the highway for two days and the northbound lanes for three days.

Flooding also occurred during storms in March 1995. On March 10, the Guadalupe River and Los Gatos Creek combined to produce the highest flow on record. The flow rate in March was estimated at 10,500 cubic feet per second (cfs), with a 25-year return period. Because streets were flooded, residents and workers in office buildings were forced to evacuate. Between 200 and 300 houses and buildings were flooded from four separate breakouts along the Guadalupe River. The mayor of the City of San Jose declared a state of emergency on March 10, 1995. On March 13, 1995, the President of the United States declared a state of national emergency. SR 87 was closed for the second time in two months. Preliminary damage estimates exceeded $5 million.

Chapter 3. General Methodology of Alternatives Analysis

INTRODUCTION

The Section 404(b)(1) Guidelines are the substantive criteria used in evaluating requests for permits under Section 404 to discharge dredged or fill material. Review for conformance with the Guidelines is an essential component of the Corps permit evaluation. The objective of the alternatives analysis is to identify practicable alternatives that meet the basic project purpose and also to describe the environmental impacts associated with each practicable alternative. This chapter describes the general methodology that was used to conduct the alternatives analysis and develop the screening criteria that were used to remove the general categories of alternatives from further consideration.

ALTERNATIVES ANALYSIS

Six general categories of alternatives were analyzed to determine whether they met the project objectives. If project objectives were met, an alternative would be explored further to assess whether it was practicable and would result in fewer adverse environmental impacts. The general categories of alternatives analyzed included the following alternatives:

- No-Project Alternative,
- Non-Structural Alternative,
- Upstream Reservoir Construction with Channel Modifications Alternative,
- Change Upstream Reservoir Operation with Channel Modifications Alternative,
- Off-Stream Storage with Channel Modifications Alternative, and
- In-Stream Channel Modifications Alternative.

Screening Criteria

Alternatives must be evaluated in a manner that is consistent with the Guidelines. The failure of any potential alternative to meet the project purpose must be explained clearly.

Specific and consistent criteria and assumptions were developed to screen the alternatives and determine which practicable alternatives would meet the project purpose. A tiered approach to the alternatives analysis was the most efficient method to complete this process. Three stages of evaluation were developed. Each stage resulted in more specific analyses with greater resolution. Alternatives that passed any one stage of screening were more likely to be implemented and therefore required greater documentation to determine whether they should be retained or rejected. Criteria were developed to screen alternatives based on whether the alternative met the project purpose; and the alternative's cost, site and resource availability, technical feasibility, environmental impacts, and jurisdictional constraints.

Screening Procedure

First-Stage Evaluation

A first-stage evaluation was conducted to determine which alternatives met the screening criteria (described below). This evaluation eliminated those alternatives that could not reasonably meet the screening criteria. Strict adherence to stated criteria was not followed in the first-stage evaluation to ensure that generally described alternatives that lacked detailed information were not unfairly removed from the process. Environmental impacts were considered in conjunction with all the other criteria in this phase, but only at a general or reconnaissance level.

Second-Stage Evaluation

In the second-stage evaluation, alternatives also were analyzed to determine whether they met the screening criteria. Evaluation of alternatives at this stage required more detailed analysis because clear and compelling reasons for rejection were not necessarily obvious. The evaluation consisted largely of engineering task work, but environmental analyses were more detailed than during the first-stage evaluation. Cost alone was not a factor for removing an alternative from the screening analysis.

Third-Stage Evaluation

The third-stage evaluation reviewed specific alternatives in detail. The scope of this third-stage evaluation was commensurate with, and a part of, the environmental impact evaluations necessary to complete the EIR/EIS. Detailed environmental assessments were conducted on the alternatives during this step. The results are presented in the draft EIR/EIS. Most of this evaluation was environmental in scope, with a reduced proportion of engineering studies from those conducted for the first- and second-stage evaluations. Cost and environmental impacts prior to mitigation were the criteria used for the final screening.

Development of Screening Criteria

The following section presents the supporting information used to develop the criteria for evaluating whether alternatives met the District's project purpose.

Project Purpose

- Containment of the one percent flood

An alternative must be able to contain the one percent flood, thereby providing flood protection for areas adjacent to the Guadalupe River and its tributaries.

The Guadalupe River has a long history of flooding. Potential flood damage to surrounding properties and the substantial amount of channel maintenance required pose a major threat in the Guadalupe River watershed. Over $280 million (1995 dollars) in damages would occur as a result of a one percent flood. Lesser floods also can cause significant damage and inconvenience, as witnessed during the 1982, 1983, 1986, and 1995 floods. Over the long-term, annual flood damages without the project would be expected to average about $20.6 million (1995 dollars).

Project Purpose Components

- Maintenance access

An alternative should provide adequate maintenance access to the Guadalupe River.

A major maintenance concern for the District is the lack of access to the channel for maintenance. Because of limited access points to the river, proper maintenance is difficult and costly. Another District concern is the absence of a continuous right of way. District policy prohibits the performance of flood control maintenance work on facilities without a permanent right of way. Private property owners assume responsibility for keeping the river clear.

Historically, District maintenance work has included sediment and debris removal, tree work, erosion repair, and vegetation control. The lack of right of way for the Guadalupe River has limited District maintenance work to hand removal of woody growth along the channel bottom and lower banks. In addition, the District cannot effectively remove debris or repair bank erosion without adequate access for vehicles.

- Erosion control

An alternative should prevent active erosion due to unstable banks in the project area.

Active erosion occurs due to unstable banks throughout the project area. The most severe problems occur from Willow Street to Curtner Avenue. In this section, bank erosion is attributed to high-flow velocities that cause scouring at the toe of the banks. As the undercut side slopes become saturated, large sections of the banks slough into the channel. Because of the unstable banks and unprotected trees, private properties immediately adjacent to the Guadalupe River are at risk from bank failures and debris blockages. Erosion of the channel banks has denuded all vegetation from numerous areas along the Guadalupe River. The aesthetic qualities of the Guadalupe River also have been degraded where concrete rubble or sack concrete were placed to protect steep slopes and eroded channel banks.

- Sedimentation problems

An alternative should reduce and prevent significant sedimentation problems.

The most significant sedimentation problems in the Guadalupe River watershed occur between Highway 237 and Montague Expressway. The problems in this area are mainly due to the tidal currents that carry suspended silts from the San Francisco Bay and deposit them in the channel. Over time, beaches are formed and vegetation eventually establishes on them. The current average annual cost of removing the sediment and vegetation is approximately $130,000. This cost will likely increase when disposal sites near Guadalupe River are no longer available. Upstream of the tidal zone area, sediment in streams is mostly generated from active channel erosion. This sediment tends to be deposited in areas where the channel is wide and has a mild slope, such as between Highway 101 and I-880 in the Guadalupe River, between Branham Lane and Blossom Hill Road in the Guadalupe River, and at the confluence of Guadalupe and Alamitos Creeks. To date, sediment removal has been infrequent. However, after the Corps completes improvements to the river in downtown San Jose area, sediment removal costs are expected to be approximately $100,000 annually.

- Local drainage problems

An alternative should include measures to reduce local drainage problems.

Within the context of this study, local drainage is defined as the system of gutters, storm drain inlets, storm sewers, and outfall structures that convey local surface runoff into the creek or flood control channel. The local drainage facilities are owned, operated, and maintained by the cities or property owners whose lands they drain.

Most of the local drainage outlets in the Guadalupe River are installed with flap gates to prevent reverse flow and are designed to discharge into the river by gravity. When the water levels in the river rise above the elevations of the drainage outlets, local runoff is prevented from entering the channel and water accumulates in the streets until the floodflows from the storm peak.

Cost

An alternative must be cost effective.

The District developed a project cost criterion that focuses on selecting the project alternative that is the least cost alternative in concert with complying with the other objectives and minimizing impacts on wetlands and riparian habitat.

Site and Resource Availability

An alternative must include available sites and resources.

Sites and resources for an alternative must be reasonably available to the District, taking into consideration cost, logistics, and time constraints.

Technical Feasibility

An alternative must have no significant geotechnical and engineering problems, or involve questionable or untested technology.

Existing technology must be adequate to ensure that the District's flood prevention objective can be reasonably met. Reliance on untested technology puts the District at risk of not meeting the project objective.

Environmental Impacts

An alternative must have no unacceptable environmental impacts.

The primary purpose of the Section 404(b)(1) Guidelines is to ensure that the least environmentally damaging practicable alternative is used to meet a basic project purpose. Certain alternatives may have major unacceptable environmental impacts that render the alternative impracticable. In many cases, a certain alternative or type of alternative will result in greater adverse environmental impacts than other types of practicable alternatives. In these cases, the alternatives with major environmental impacts can be considered impracticable for meeting the basic project purpose.

Jurisdictional Constraints

The permit requirements of an alternative should be able to be reasonably completed, taking into consideration cost, logistics, and existing technology.

Necessary permits must be foreseeably obtainable from public agencies. An alternative cannot be deemed practicable if permit acquisition is so costly and time consuming that the fundamental project purpose cannot be met.

Chapter 4. First- and Second-Stage Screening Evaluation Results

FIRST-STAGE EVALUATION

Six general categories of alternatives were analyzed during the first-stage screening evaluation. These general categories are the No-Project Alternative, Non-Structural Alternative, Upstream Reservoir Construction with Channel Modifications Alternative, Change Upstream Reservoir Operation with Channel Modifications Alternative, Off-Stream Storage with Channel Modifications Alternative, and In-Stream Channel Modifications Alternative. Descriptions of the general categories of alternatives are presented below. Refer to the Santa Clara Valley Water District Guadalupe River Watershed Planning Study, Engineer's Report (August 1996) for additional information on the alternatives.

Project Descriptions

No-Project Alternative

Under the No-Project Alternative, the District would not take any direct action to reduce the flood hazard from Guadalupe River. Residents and businesses within the floodplain would continue to face potential hardships as a result of flooding. Private properties immediately adjacent to the Guadalupe River and its tributaries would continue to be at risk from streambank failure and blockage by debris. In the event of the one percent flood, approximately 2,200 acres would be inundated. Over 7,200 homes, 230 businesses, 11 public buildings, and 1,390 automobiles would be inundated by floodwaters from the Guadalupe River.

Non-Structural Alternative

The Non-Structural Alternative would solve the flooding of structures in the floodplain without channel modifications. The structures subject to potential flood damage would be flood proofed or purchased and removed. Affected streets and public areas would still be subject to frequent flooding.

Upstream Reservoir Construction with Channel Modifications Alternative

The Upstream Reservoir Construction with Channel Modifications Alternative would include constructing a new dam on the Guadalupe River approximately 2 miles downstream of the existing Guadalupe Reservoir and enlarging the Almaden Dam. These actions would not reduce sufficiently the one percent flood magnitude; therefore, significant channel modifications would still be necessary in the downstream reaches on the Guadalupe River.

Change Upstream Reservoir Operation with Channel Modifications Alternative

Under the Change Upstream Reservoir Operation with Channel Modifications Alternative, existing reservoir use would be converted from water supply to flood control. Existing upstream reservoirs would be used for temporary attenuation of peak floodflow through flood-routing. This option would not sufficiently reduce the one percent flood magnitude; therefore, significant channel modifications would still be necessary in the downstream reaches of the Guadalupe River.

Off-Stream Storage with Channel Modifications Alternative

For the Off-Stream Storage with Channel Modifications Alternative, peak one percent floodflows would be diverted into an off-stream storage site, which would reduce the Guadalupe River peak flow rate to an amount that could safely pass through the downstream channel. This alternative would still require some downstream channel improvements.

In-Stream Channel Modifications

The In-Stream Channel Modifications Alternative would include in-stream modifications in two discrete segments of the river: one from Highway 101 to I-880 and another from I-280 to Blossom Hill Road; and on adjacent portions of two tributaries, Canoas Creek and Ross Creek. In-stream channel modifications would include constructing bypass channels; widening the channel, adding benches, and lining portions of the channel with gabions and cribwalls; and constructing floodwalls and levees.

Screening Results

Table 4-1 presents the results of the first-stage screening evaluation. Information for Table 4-1 was derived from the November 1996 Engineer's Report prepared for this project. Explanations for categories of alternatives that did not meet the screening criteria are presented in the table; a "yes" is provided if the alternative meets the screening criteria. The In-Stream Channel Modifications Alternative is the only alternative that was carried forward to the second-stage screening evaluation.

Table 4-1. First-Stage Screening Evaluation Results

Alternative	Project Purpose	Cost[a]	Site and Resource Availability	Technical Feasibility	Environmental Impacts	Jurisdictional Constraints	Screening Results
No-Project	No[b]	$280 million	Yes		- Degraded and discontinuous riparian corridor would remain - Moderate wetland and wildlife habitat would remain or worsen - Degraded fish habitat would remain or worsen	None known	Removed because did not meet project purpose
Non-Structural	No[b]	$600 million	Yes	Yes	- Degraded and discontinuous riparian corridor would remain or worsen - Moderate wetland and wildlife habitat would remain or worsen - Degraded fish habitat would remain or worsen	None known	Removed because did not meet project purpose
Upstream Reservoir Construction with Channel Modifications	Yes	$173 million	Yes	Yes	- Major impacts on 1.6 creek miles and 167 acres of riparian vegetation at reservoir sites - Additional impacts on 2.7 creek miles from channel modifications (impacts can be partially mitigated) - Major impacts on wetlands at reservoir sites and from channel modifications (impacts can be partially mitigated in Reaches 10 and 12) - Major impacts on fish and wildlife habitat at reservoir sites and from channel modification (impacts can be partially mitigated)	Unknown	Removed because of environmental impacts. Alternative was also not cost effective
Change Upstream Reservoir Operation with Channel Modifications	Yes	$120 million	Yes	Yes	- Loss of 13,900 acre-feet per year because reservoirs would be kept empty during winter - Impacts on riparian vegetation would be mitigated onsite and on adjacent lands - Major impacts on wetlands at reservoir sites and from channel modification (impacts can be partially mitigated) - Major impacts on wildlife habitat at reservoir sites and from channel modification (impacts can be partially mitigated) - Major impacts on fish habitat at reservoir sites and from channel modifications; loss of water releases from reservoirs in summer (impacts can be partially mitigated)	Unknown	Removed because of environmental impacts

Table 4-1. Continued

Alternative	Project Purpose	Cost[a]	Site and Resource Availability	Technical Feasibility	Environmental Impacts	Jurisdictional Constraints	Screening Results
Offstream Storage with Channel Modifications	Yes	$600 million	No[c]	No[d]	Yes	No[e]	Removed because of cost, site availability, technical feasibility, and potential permit delays
In-Stream Channel Modifications	Yes	$115.3 million	Yes	Yes	Yes	None known	Carried forward

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[a] Cost is estimated in 1993 dollars.
[b] Flooding would still occur under this alternative.
[c] A portion of the 63 additional acres that are needed for this alternative has been developed and is no longer available.
[d] The technical feasibility of this alternative is a high risk.
[e] Cost and time involved to obtain permits would be unreasonable.

SECOND-STAGE EVALUATION

Three alternatives within the category of in-stream channel modifications were analyzed during the second-stage screening evaluation: Preferred Project Alternative, MVI Alternative, and Stream Restoration Alternative. The process in which these alternatives were formulated is described below.

Analysis of Reaches for Channel Modification Alternatives

During the second stage screening of the alternatives, the District evaluated each stream reach to determine feasible channel modification alternatives. The following summarizes the results for each stream reach.

Reach A: Highway 101 to Interstate 880

The only alternative considered in this reach is to lower the existing maintenance road on the west bank at Highway 101, Airport Island bridge, Airport Parkway bridge, and future Skyport Drive bridge to provide underpasses for a continuous maintenance road.

Reach 6: Interstate 280 to Southern Pacific Railroad

The feasible alternatives for this reach are the widened channel and the bypass channel.

Reach 7: Southern Pacific Railroad to Union Pacific Railroad

Reach 7A: (Southern Pacific Railroad to Alma Avenue). The feasible alternatives considered in Reach 7A are channel widening, gabion bypass channel, and earth bypass channel.

Reach 7B: (Alma Avenue to Union Pacific Railroad). The feasible alternatives considered in Reach 7B are channel widening and bypass channel.

Reach 8: Union Pacific Railroad to Willow Glen Way

The alternatives considered feasible in this reach are widened gabion, gabion bypass, and earth bypass channels.

Reach 9: Willow Glen to Curtner Avenue

The feasible alternatives considered for this reach are channel widening, covered bypass channel, and earth bypass.

Reach 10: Curtner Avenue to Capitol Expressway

Reach 10A: Curtner Avenue to Southbound Almaden Expressway. The feasible alternatives considered in Reach 10A are channel widening, covered bypass channel, and earth bypass channel.

Reach 10B: Southbound Almaden Expressway to Stream Flow Gage Station 23B. The feasible alternatives considered are either a levee or a floodwall.

Reach 10C: Stream Flow Gage Station 23B to Capitol Expressway. The feasible alternatives considered in this reach are bypass channel and channel widening.

Reach 11: Capitol Expressway to Branham Lane

The feasible alternatives considered for this reach are gabion channel widening and bypass channel.

Reach 12: Branham Lane to Blossom Hill Road

The feasible alternatives considered in this reach are levee raising and bypass channel.

Reach 13: Blossom Hill Drop Structure -- Construction of a Step-Pool Ladder

The feasible alternative considered in this reach is construction of a step-pool ladder at the drop structure.

Results for Analysis of Reaches for Channel Modification Alternatives

Table 4-2 summarizes and groups together various alternatives for each of the reaches under broad plans having different objectives. The District looked at technically feasible options by reach and assessed their cost, and affect on the physical environment, biological environment, and sociocultural environment.

The Preferred Project (Selected Project in Table 4-2) was selected as the alternative that meets all of the District's objectives. The Minimize Vegetation Impacts (MVI) plan is the combination of alternatives which most avoids environmental impacts. This alternative was developed to minimize

TABLE 4-2
Guadalupe River Planning Study
Summary of Alternative Plans
Reach A, Interstate 280 to Blossom Hill Road, Canoas Creek, and Ross Creek

Reach	Preferred Plan[1]	Minimize Vegetation Impacts Plan[2]	Stream Restoration Plan[2,3]
Reach A: Highway 101 to I-880	Levee/Floodwall	Levee/Floodwall	Levee/Floodwall
Right of Way Cost:	0	0	0
Construction Cost:	2.0	2.0	2.0
Mitigation:			
Right of Way Cost:	0	0	0
Revegetation Cost:	0	0	0
TOTAL COST:	2.0	2.0	2.0
Reach 6: I-280 to SPRR	Gabion Bypass Channel	Gabion Bypass Channel	Earth Bypass Channel
Right of Way Cost:	9.8	9.8	24.6
Construction Cost:	6.6	6.6	7.6
Mitigation:			
Right of Way Cost:	0.5	0.5	0.0
Revegetation Cost:	0.2	0.2	0.3
TOTAL COST:	17.1	17.1	32.5
Reach 7A: SPRR to Alma Avenue	Gabion Bypass Channel	Gabion Bypass Channel	Earth Bypass Channels (East and West Banks)
Right of Way Cost:	6.7	6.7	13.6
Construction Cost:	9.3	9.3	6.9
Mitigation:			
Right of Way Cost:	0	0	0
Revegetation Cost:	0	0	0.5
TOTAL COST:	16.0	16.0	21.0
Reach 7B: Alma Avenue to UPRR	Gabion Bypass Channel	Gabion Bypass Channel	Gabion Bypass Channel
Right of Way Cost:	1.3	1.3	1.3
Construction Cost:	2.8	2.8	2.8
Mitigation:			
Right of Way Cost:	0	0	0
Revegetation Cost:	0	0	0
TOTAL COST:	4.1	4.1	4.1

TABLE 4-2
Guadalupe River Planning Study
Summary of Alternative Plans
Reach A, Interstate 280 to Blossom Hill Road, Canoas Creek, and Ross Creek
(continued)

Reach	Preferred Plan[1]	Minimize Vegetation Impacts Plan[2]	Stream Restoration Plan[2,3]
Reach 8: U.P.R.R. to Willow Glen Way	Gabion Bypass Channel	Gabion Bypass Channel	Earth Bypass Channels (East and West Banks)
Right of Way Cost:	4.8	4.8	10.2
Construction Cost:	4.3	4.3	3.5
Mitigation:			
Right of Way Cost:	0.5	0.5	0
Revegetation Cost:	0.2	0.2	0.5
TOTAL COST:	9.8	9.8	14.2
Reach 9: Willow Glen Way to Curtner Avenue	Widened Cribwall Channel with Mitigation Bench	West Bank Earth Bypass Channel	West Bank Earth Bypass Channel
Right of Way Cost:	3.9	21.9	21.9
Construction Cost:	10.0	4.1	4.1
Mitigation:			
Right of Way Cost:	4.7	0.0	0.0
Revegetation Cost:	2.0	0.0	0.0
TOTAL COST:	20.6	26.0	26.0
Reach 10A: Curtner Ave. to Almaden Expwy. (SB) & Canoas Creek	Widened Cribwall Channel with Mitigation Bench and 3.5′ Floodwalls in Canoas Creek	West Bank Earth Bypass Channel and 1.5′ Floodwalls in Canoas Creek	West Bank Earth Bypass Channel and 1.5′ Floodwalls in Canoas Creek
Reach 10A			
Right of Way Cost:	0.0	5.1	5.1
Construction Cost:	2.9	1.3	1.3
Mitigation:			
Right of Way Cost:	2.1	0.2	0.2
Revegetation Cost:	0.9	0.2	0.2
Canoas Creek:			
Construction Cost:	1.8	1.7	1.7
TOTAL COST:	7.7	8.5	8.5

TABLE 4-2
Guadalupe River Planning Study
Summary of Alternative Plans
Reach A, Interstate 280 to Blossom Hill Road, Canoas Creek, and Ross Creek
(continued)

Reach	Preferred Plan[1]	Minimize Vegetation Impacts Plan[2]	Stream Restoration Plan[2, 3]
Reaches 10B & 10C: Almaden Expwy. (SB) to Capitol Expwy.	Levees and Widened Gabion Channel with Mitigation Bench U/S Gage Sta. 23B	Levees and Earth Bypass Channel U/S Gage Sta. 23B	Levees and Earth Bypass Channel U/S Gage Sta. 23B
Right of Way Cost:	3.8	8.0	8.0
Construction Cost:	6.4	6.8	6.8
Mitigation:			
Right of Way Cost:	3.0	2.0	2.0
Revegetation Cost:	1.7	1.1	1.1
TOTAL COST:	14.9	17.9	17.9
Reach 11: Capitol Expressway to Branham Lane	East Bank Widened Gabion Channel With Bench	Earth Bypass Channel	Earth Bypass Channel
Right of Way Cost:	2.3	13.4	13.4
Construction Cost:	2.5	4.9	4.9
Mitigation:			
Right of Way Cost:	4.5	2.0	2.0
Revegetation Cost:	1.8	1.3	1.3
TOTAL COST:	11.8	21.6	21.6
Reach 12: Branham Lane to Blossom Hill Road	Levees Raising	Bypass Channel, Offstream Ponds, and Levee Raising	Bypass Channel, Offstream Ponds, and Levees Raising
Right of Way Cost:	4.0	22.2	22.2
Construction Cost:	4.1	9.5	9.5
Mitigation:			
Right of Way Cost:	0.0	0.0	0.0
Revegetation Cost:	0.0	0.0	0.0
TOTAL COST:	8.1	31.7	31.7

TABLE 4-2
Guadalupe River Planning Study
Summary of Alternative Plans
Reach A, Interstate 280 to Blossom Hill Road, Canoas Creek, and Ross Creek
(continued)

Reach	Preferred Plan[1]	Minimize Vegetation Impacts Plan[2]	Stream Restoration Plan[2, 3]
Ross Creek: Almaden Expressway to Jarvis Avenue	Widened Channel with ACM Lining	Widened Channel with ACM Lining	Widened Channel with ACM Lining
Right of Way Cost:	0.0	0.0	0.0
Construction Cost:	3.9	3.9	3.9
Mitigation:			
Right of Way Cost:	0.0	0.0	0.0
Revegetation Cost:	0.0	0.0	0.0
TOTAL COST:	3.9	3.9	3.9
Total Project Costs:			
Right of Way Cost:	36.6	93.2	120.3
Construction Cost:	56.6	57.2	55.0
Mitigation:			
Right of Way Cost:	15.3	5.2	4.2
Revegetation Cost:	6.8	3.0	3.9
TOTAL COST:	115.3	158.6	183.4

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[1] Potential loss of revenue (property tax and benefit assessment) up to $30,000 per year.

[2] Potential loss of recharge water (up to $600,000 per year) due to accretion flows in Reach 12.

[3] Does not include complete reconstruction of a geomorphological "bankfull" channel in every reach of the natural channel.

impacts to the riparian corridor that are associated with the Preferred Project. The Stream Restoration plan, when compared to other alternatives, is the combination of alternatives which would best restore the functions and values of the historic riparian corridor by preserving and enhancing the existing vegetation, minimizing the need for bank protection, using flatter slopes to allow for natural regeneration, and expanding the riparian plantings. It provides an opportunity for significant new riparian vegetation to re-establish itself and attempts to create a functional physical and biological river system that allows natural processes to occur while restoring and maintaining habitat values for fish and wildlife. It does not include complete reconstruction of a geomorphological "bankful" channel in every reach of the natural channel.

Project Descriptions

Preferred Project Alternative

The Preferred Project includes channel modifications in two discontinuous segments of the Guadalupe River: one from Highway 101 to I-880 (Reach A) and another from I-280 to Blossom Hill Road (Reaches 6 to 13). Modifications are also proposed on two tributaries, Canoas Creek and Ross Creek. Flooding issues that have been identified in these areas and detailed descriptions of proposed modifications are included in the EIR\EIS and in the Engineer's Report. Figure 4-1 illustrates the proposed modifications for the Guadalupe River, Canoas Creek, and Ross Creek.

The following text summarizes flood control and related facilities that are proposed for each reach and subreach in the Guadalupe River between I-280 and Blossom Hill Road. More detailed descriptions are included in Chapter 3 of the EIR\EIS and in the Engineer's Report.

Reach A: Highway 101 to I-880 - Levees and Channel Widening. Reach A is located 2.25 miles north of I-280 and is not contiguous with Reach 6. The channel in this reach is nearly adequate and needs only minor modifications to convey the one percent flow with adequate freeboard. From Airport Boulevard to I-880 the channel would be widened to the east by Caltrans creating a bench up to 110 feet wide about 10 feet above the channel bottom. A portion of the bench would be used as a maintenance road and the remainder would be revegetated. The District would construct a floodwall up to 2 feet on the west bank and a levee on the east bank from Highway 101 to Airport Island Bridge. In the interim, before Highway 87 is constructed, levees up to 2 feet high would be constructed on both the east bank and on the west bank from Airport Island Bridge to Airport Parkway Bridge.

Reach 6: I-280 to Southern Pacific Railroad - Gabion Bypass Channel. The natural stream channel would remain undisturbed except at erosion sites and at the outlet of the bypass channel. A parallel bypass channel lined with stepped gabions (wire mesh baskets filled with rocks) would be constructed to the east of the Guadalupe River. The bypass channel would be about 15 feet deep with a bottom width of 85 feet and 1:1 (1 foot horizontal to 1 foot vertical) side slopes. The bypass outlet structure would be located upstream of I-280. The construction would necessitate the removal of 54 homes and one partial backyard area. The District would construct a west bank levee to meet FEMA's minimum 3.5-foot freeboard requirements.

Reach 7: Southern Pacific Railroad to Union Pacific Railroad - Composite Bypass Channel. The natural stream channel would remain undisturbed except for repair at erosion sites. This alternative would convey the one percent flood flow using an open bypass channel with stepped-gabions. The bypass alignment would follow parallel and to the east of the existing Guadalupe River. The stepped-gabion bypass would have 1:1 side slopes and a bottom width varying from 30 to 85 feet. The gabion bypass channel from Alma Avenue to the Union Pacific Railroad (UPRR) (through the Elk's Lodge property) will have a 7-foot high floodwall on the east bank. Parking area losses will be replaced in coordination with the Elk's Lodge. Construction of the bypass would require the relocation of 13 commercial businesses between Lelong Street and the Guadalupe River near Willow Street and an easement at the Elks Lodge.

Reach 8: UPRR to Willow Glen Way - Gabion Bypass Channel. The natural stream channel would remain undisturbed except for repair at erosion sites. A parallel, gabion-lined trapezoidal bypass channel to carry peak flood flows would be constructed to the east of the existing Guadalupe River. The bypass channel would have an 85-foot-wide bottom and 1:1 side slopes with stepped gabions. The proposed alignment for this reach would require the removal of 23 homes on the west side of Mackey Avenue.

The inlet to the bypass would consist of a drop structure (190-foot gabion weir) just downstream of Willow Glen Way. The weir would be designed so that flows less than approximately 1,500 cfs would continue in the natural channel. During a one percent flood event, 9,600 cubic feet per second (cfs) would be diverted into the bypass channel, leaving 5,000 cfs in the river.

Reach 9: Willow Glen Way to Curtner Avenue - Widened Gabion/Crib Wall Channel. The west bank of the Guadalupe River would remain undisturbed except for repair of erosion sites. The east bank of the river would be widened up to 60 feet through portions of this reach, creating a bench about five to 12 feet above the river bottom. The bench width would vary from 20 to 70 feet and would include a maintenance road. The natural bank and vegetation between the stream bottom and the proposed bench elevation would be preserved where possible. Removal of six homes, two partial backyard areas, and two businesses would be necessary.

Within this reach, two short bypasses would be created to preserve existing vegetation, thereby creating islands. A 500-foot long bypass channel between Willow Glen Way and Pine Avenue (Pine Bypass) would have an elevation of 9 feet above the existing channel bottom and would have a bottom width of 40 feet and stepped gabions on 1:1 side slopes. A 500-foot-long bypass channel upstream of Malone Road (Malone Bypass) would have an elevation of 5 feet above the existing channel bottom and would have a bottom width of 40 feet. The east bank would be protected with a cribwall on 1:6 slopes. The west bank of the bypass would consist of 1:1 side slopes with stepped gabions. Both bypasses would be designed so that flows less than 1,500 cfs would remain in the natural channel.

Channel. The east bank would be widened, creating a bench varying from 18 to 40 feet wide about 5 feet above the present channel bottom. Slopes would be lined with cribwalls on 1:6 slopes. A maintenance road would be constructed along the bench. The east bank widening would remove mature riparian vegetation. All the mature riparian vegetation on the west bank would be preserved.

Reach 10B: Southbound Almaden Expressway to Stream Gage Station 23B - Levee and Revegetation. A levee up to about 4 feet high with a top width of 12 feet and 2:1 side slopes would be constructed on the west bank between northbound and southbound Almaden Expressway to provide required freeboard. At Lincoln Avenue overpass, a 4-foot high floodwall would be constructed for a length of 300 feet, conforming to the levee. Upstream of northbound Almaden Expressway, a low-flow or bankfull channel would be constructed and its banks revegetated.

Previously, the weir at Stream Gage Station 23B inhibited fish migration. Water did not crest over the weir directly into the plunge pool, reducing the effectiveness of the plunge pool. Boulders below the water surface near the weir further reduced passage capabilities by reducing pool depth and passage corridors. The District modified the structure in 1995 and enlarged the plunge pool below the weir thereby creating favorable hydraulic conditions for fish passage. The District would lower the gage station to the channel invert elevation and construct vortex rock weir features to link the channel in Reach 10C with the proposed restored channel in Reach 10B.

Reach 10C: Stream Gage Station 23B to Capitol Expressway - Widened Gabion Channel. Between Hillsdale Avenue and the Capitol Expressway, the east bank would be widened, creating a bench varying from 20 to 58 feet in width and about 8 feet above the present channel bottom. A maintenance road would be constructed along the bench. A portion of the depressed bench would be revegetated. The west bank would remain undisturbed, and barren areas would be revegetated. The east bank above the maintenance road would be lined with cribwalls at a 1:6 slope. The bank below the maintenance road would be lined with stepped gabions.

The existing drop in the channel bottom downstream of Hillsdale Avenue, consisting of a concrete apron and weir that acts as a drop structure and fish barrier, would be removed and the channel bottom excavated to create a continuous slope. A low-flow channel would be constructed using rock weirs, root wads, and other stream restoration techniques.

Reach 11A: Capitol Expressway to Bryan Avenue - Bypass and Widened Gabion Channel. Along this entire reach, the west bank would remain undisturbed. The existing trees on the west bank would be preserved, and barren areas would be revegetated. The east bank would be widened from Capitol Expressway to the confluence of the bypass channel.

A 700-foot-long bypass channel, with 2:1 side slopes on the west bank for revegetation, would be constructed east of the natural channel from Station 915+00 to 922+00. The bypass channel would be 50 feet wide at the bottom with a rock-lined invert and partial cribwall treatment (see Engineer's Report). The entrance to the bypass channel would be at an elevation such that flows less than approximately 1,500 cfs would continue in the natural channel.

Excavation along the east bank is proposed upstream of the bypass channel entrance to enlarge the existing channel and create a depressed maintenance road on the east bank from 5 to 8 feet above the existing channel bottom. The bank below the bench would be sloped 2:1. The slope above the bench would be gabion-lined and sloped 1:1. Channel widening would increase flow-carrying capacity and allow the one percent flood to be contained with freeboard. Existing vegetation on the west bank would be undisturbed and barren areas revegetated. Existing concrete rubble that acts as a fish barrier would be removed from the channel bottom.

Reach 11B: Bryan Avenue to Ross Creek - West Bank Widening with Cribwalls. The west bank would be excavated with a 1:6 side slope lined with cribwalls to create an earth bench up to 40 feet wide, located about 5 feet above the channel bottom to increase channel capacity and provide maintenance access. Maintenance roads would be located on the west bench and east top of bank. An abandoned San Jose Water Company (SJWCo) concrete low-flow crossing that acts as a drop structure and fish barrier would be removed, and the channel bottom would be excavated at this location. The bench would be revegetated with riparian species. Two homes and one SJWCo well would be affected.

Reach 11C: Ross Creek to Branham Lane - West Bank Widening with Cribwalls. The west bank would be excavated with a 1:6 side slope lined with cribwalls, creating a bench about 6 feet above the channel bottom to serve as a floodway and revegetation site. Some of the existing trees within 11 feet of the channel bottom would be preserved. Some areas now bare would be revegetated along the east bank and on District land at Ross Creek. Existing vegetation on the east bank would not be affected by this alternative.

Where Ross Creek enters the river, the Ross Creek culvert would be extended by 80 feet. The extension would be used to orient the culvert downstream. A concrete apron and stepped pools for fish passage into Ross Creek would be constructed at the culvert outlet.

Reach 12: Branham Lane to Blossom Hill Road - Widened Earth Channel with Bench. Reach 12 is nearly adequate to convey the one percent flood. Between Branham Lane and the future Chynoweth Bridge crossing, the west bank would be revegetated. Between the seasonal instream percolation ponds and Blossom Hill Road, the west bank would be widened 25 feet to the west to create a revegetation bench. The levees would be reconstructed and raised up to 6 feet on both banks between Chynoweth Avenue and SR 85.

To mitigate impacts of the proposed flood control project on riparian and wetland habitat, the District would create large areas of riparian, wetland, and open water habitat in Reach 12. The plan includes excavating up to 20 feet of soil on land adjacent to the river to create conditions conducive to wetland and riparian habitat development. Approximately 4.7 acres of recharge pond would be created to replace the loss of existing off-stream percolation ponds.

Reach 13: Blossom Hill Drop Structure - Construction of a Step-Pool Ladder. Construction of a step-pool ladder at the 15-foot Blossom Hill Drop Structure is part of the proposed project.

Tributaries. Minor modifications to two tributaries of the Guadalupe River are proposed as part of this project: Canoas Creek and Ross Creek. The modifications are to control backwater flooding caused by flows in the river.

Canoas Creek: Guadalupe River to Nightingale Drive - Floodwalls. Additional culverts would be installed at Almaden Expressway and Nightingale Drive. Floodwalls up to 3-4 feet high would be constructed on both banks between the Guadalupe River and extending upstream of the Nightingale Drive culvert.

Ross Creek: Guadalupe River to 700 Feet Upstream of Jarvis Avenue - Floodwalls. To contain the one percent flow, the culvert at Almaden Expressway and the culvert at Jarvis Avenue would be enlarged. From Almaden Expressway to 700 feet upstream of Jarvis Avenue, the channel would be widened on the north bank to 2 feet from the existing right-of-way. Both banks would be lined with articulated concrete mat at a 1:1 slope, and the existing 18-foot wide maintenance road would remain on the top of the south bank. The existing sanitary sewer pipe under Almaden Expressway would be relocated in coordination with the City. Relocation of any existing utilities would be at District expense according to other agreements.

The District would construct stepped fish pools at the mouth of Ross Creek and install Washington-style baffffles in the new RCB culverts for future fish passage into Ross Creek. The pools will be temporarily backfilled with rock that will be removed when fishery habitat in Ross Creek improves in the future and DFG concurs in removal of the rock. DFG has indicated that anadromous fish migration into Ross Creek should be discouraged.

Minimize Vegetation Impacts Alternative

The Minimize Vegetation Impacts (MVI) Alternative was identified as the plan that best avoids impacts to the riparian corridor that are associated with the Preferred Project. Project impacts were determined to be the most substantial in Reaches 9, 10A, 10C, 11A, 12 and 13. Therefore, this alternative proposes alternative channel modifications to achieve similar flood protection as the Preferred Project. The MVI Alternative is identical to the Preferred Project except in Reaches 9, 10A, 10C, 11A, 12, and 13 as described below.

Under the MVI Alternative, as described below, an earth bypass would be constructed in Reaches 9 and 10A, and 1.5-foot-high floodwalls would be constructed on Canoas Creek. A bypass channel would be constructed east of the natural channel in Reach 10C from 500 feet downstream of Stream Gage Station 23B to 150 feet downstream of Foxworthy Avenue. In Reach 11A, a bypass channel would be constructed east of the natural channel. In Reach 12, an earth bypass would be constructed west of the natural channel and the in-stream percolation ponds would be replaced with off-stream ponds. Proposed changes in Reaches 9, 10A, 10C, 11A and 12 are described below.

Reaches 9 and 10A: Willow Glen Way to Canoas Creek. An earth bypass channel would be constructed west of the natural channel, and channel banks would have 2:1 side slopes. Construction of the bypass channel would require the removal of 90 homes. The natural channel would remain undisturbed, except at the diversion inlets.

In addition, 1.5-foot-high floodwalls would be constructed in Canoas Creek between Almaden Expressway and Nightingale Drive.

Reach 10C: Stream Gage Station 23B to Capitol Expressway. A bypass channel would be constructed east of and parallel to the Guadalupe River from 500 feet downstream of Stream Gage Station 23B to 150 feet downstream of Foxworthy Avenue. The bypass channel would be 18 feet deep and 60 feet wide and lined with stepped gabions at a slope of 1:1. Tree wells would be provided in the gabions where feasible. The right-of-way required would be approximately 300 feet east of the centerline of the Guadalupe River, a total area of 7 acres. The natural stream channel would remain undisturbed except at erosion sites, which would be repaired as needed.

Upstream of the bypass channel inlet to Hillsdale Avenue, the east bank would be excavated and a bench for a 60-foot floodway and a 40-foot revegetation area would be created 8 feet above the existing channel bottom. The west bank and lower east bank would remain as existing, leaving the vegetation undisturbed. The upper east bank would be protected with stepped gabions with a 1:1 slope and tree wells would be provided in the gabions where feasible.

From Hillsdale Avenue to Capitol Expressway, the east bank would be excavated. The west bank would remain undisturbed and barren areas would be revegetated. An 18-foot wide maintenance road would be located within the floodway. The bank above the maintenance road would be lined with cribwall with a 1:6 side slope. The bank below the road would be gabion lined.

A concrete weir and apron downstream of Hillsdale Avenue that acts as a drop structure and fish barrier would be removed. Fish passage at Stream Gage Station 23B would be improved.

Reach 11A: Capitol Expressway to Bryan Avenue. An earth bypass channel would be constructed east of the natural channel from Capitol Expressway to Bryan Avenue. The bypass channel would have a 90-foot bottom width and a side slope of 2:1.

Construction of the bypass channel would require the removal of 33 properties. The natural channel would be undisturbed, except at the inlet and outlet of the bypass channel. The existing concrete rubble in the channel bottom at about 600 feet upstream of Capitol Expressway that acts as a fish barrier would be removed.

Reach 12: Branham Lane to Blossom Hill Road. An earth bypass channel would be constructed west of the natural channel from the Branham Lane seasonal dam location to the future Chynoweth Avenue Bridge. The bypass channel would have a 40-foot bottom width and a side slope of 2:1.

From the future Chynoweth Avenue Bridge to Blossom Hill Road, the west bank would be widened 25 feet to the west to create a revegetation bench. The estimated loss of existing off-stream percolation ponds is 3.0 acres. The levees would be reconstructed and raised up to 6 feet on both banks of the channel.

Operation of the Branham and Blossom Hill seasonal dams would be discontinued and the in-stream percolation ponds would be replaced with new off-stream ponds. The loss of in-stream percolation ponds is estimated at 14.0 acres.

To mitigate the impacts of the proposed flood control project on riparian and wetland habitats, the District would create large areas of riparian, wetland, and open water habitat in Reach 12. The plan includes excavating up to 20 feet of soil on land adjacent to the Guadalupe River to create conditions conducive to wetland and riparian habitat development. About 18.5 acres of off-stream recharge ponds would be created in Reach 12 to replace the loss of in-stream and off-stream percolation ponds.

Both banks of the natural channel from Branham Lane to Blossom Hill Road could be revegetated. The existing vegetation on the east and west banks would remain undisturbed except at the diversion inlets and levee section.

Reach 13: Blossom Hill Drop Structure. Construction of a step-pool ladder at the 12-foot Blossom Hill Drop Structure is a part of this alternative.

Stream Restoration Alternative

The Stream Restoration Alternative is a variation of the In-Stream Channel Modification Alternative. It is the plan that best restores the functions and values of the historic riparian corridor. This alternative consists of channel modification in Reach A and Reaches 6 to 13 to create a low-flow channel and an active floodplain terrace. A low-flow channel would be constructed in each reach to carry the 1.5-year frequency flow ("bankfull" flow) with a bypass channel; floodplain terraces would be constructed to carry higher flows.

This alternative incorporates, to the extent feasible, stream restoration techniques throughout the project area. The intent is to restore the natural sinuosity of the river channel; enhance sediment transport; and provide for long-term stabilization of the banks by restoring the plan, profile, and geometry of the active channel and incorporating strategically placed rock weirs, root wads, and other appropriate bio-remediation techniques, including revegetation. The Stream Restoration Alternative provides an opportunity for significant new riparian vegetation to re-establish itself and attempts to create a functional physical and biological river system that allows natural processes to occur while restoring and maintaining habitat values for fish and wildlife.

The Stream Restoration Alternative is similar to the MVI Alternative, with the key difference being additional bypasses in Reaches 7 and 8 and extensive in-channel modifications to accommodate a constructed low-flow channel. In each reach, the existing river channel would be modified to incorporate a new bankfull channel with a sinuosity that matches the slope, flow, and geomorphological characteristics of the river. Some existing streamside vegetation would be affected during construction. Both sides of the new bankfull channel would be revegetated or stabilized. Bypass channels or open floodplain terraces would be constructed to accommodate floodflows. Specific features of the Stream Restoration Alternative are described below and are compared to the MVI Alternative.

Estimates of habitat affected by the Stream Restoration Alternative are based on assumptions that approximately 90% of the existing wetlands in Reaches A and 6 to 13 would be affected due to the extensive work in-channel (approximately 8 acres of wetlands would be affected). In addition, approximately 20% more of the riparian habitat and shaded riverain aquatic (SRA) cover in most reaches would be affected than with the MVI Alternative because of the construction of a bankfull channel. Reaches 7 and 8 would experience much greater impacts (approximately 40% or more) than the MVI Alternative because of bypass construction. In total, over 6.0 acres of riparian habitat and over 2500 linear feet of SRA cover would be affected.

Reach A. A bankfull channel sized to contain approximately a 1.5 year flood event would be excavated to enhance sediment transport. Little or no riparian revegetation can be accommodated unless the existing boundaries of this reach are widened significantly to carry the one percent flood.

Reaches 6-8. A bankfull channel would be excavated within the existing river bottom. In Reach 6, an earth-lined east bank bypass would be constructed; in Reaches 7 and 8, an east and west bank earth-lined bypass would be constructed. The double bypasses are required in Reaches 7 and 8 to accommodate the one percent flood because the side slopes of the earth-lined bypasses are less steep than the gabion-lined side slopes of the Preferred Project and MVI Alternatives and therefore accommodate less floodflows.

Reaches 9 and 10A. An earth-lined bypass channel would be constructed west of the natural channel as in the MVI Alternative. A new bankfull channel would be excavated within the existing river channel.

Reach 10B. As in the Preferred Project and MVI Alternatives, a sinuous bankfull channel would be constructed and banks would be revegetated.

Reach 10C. Project features in this reach would be identical to the MVI Alternative, except that a bankfull channel would be constructed within the existing channel.

Reaches 11A and 11B. As in the MVI Alternative, Reach 11A would include an east bank earth-lined bypass channel. Reach 11B would include a west bank widened cribwall channel similar to the Preferred Project and the MVI Alternatives. In addition, a bankfull channel would be excavated within the existing channel.

Reach 11C. An earth-lined bypass channel would be constructed on the west bank, and a bankfull channel would be constructed within the existing river channel.

Reach 12 and 13. Construction in this reach would be similar to the MVI Alternative and would include replacing the existing in-stream percolation ponds with off-stream ponds, west bank channel widening, and creation of a bankfull channel. Construction of a step-pool ladder at the 12-foot Blossom Hill Drop Structure is proposed for this alternative in Reach 13.

SCREENING RESULTS

Table 4-3 presents the results of the second-stage screening evaluation. Explanations of the categories of alternatives that did not meet the screening criteria are presented in the table; a "yes" is provided if the alternative met the screening criteria. For the second-stage evaluation, cost alone was not a factor to remove the alternative from further consideration. Two action alternatives were carried forward to the third-stage screening evaluation: Preferred Project Alternative and MVI Alternative. These alternatives are addressed in detail in the draft EIR/EIS. The No-Project Alternative was also carried forward in compliance with NEPA and California Environmental Quality Act (CEQA) requirements.

Table 4-3. Second-stage Screening Evaluation Results

Alternative	Project Purpose	Cost[a]	Availability	Technical Feasibility	Environmental Impacts	Jurisdictional Constraints	Screening Results
Preferred Project	Yes	$115.3 million	Yes	Yes	1.85 wetlands, 9.28 acres riparian vegetation, and 3,959 linear feet of shaded riverine aquatic (SRA) cover	None known	Carried forward to the third-stage evaluation
Minimize Vegetation Impacts	Yes	$158.6 million	Yes	Yes	1.75 acres wetlands, 5.01 acres riparian vegetation and 2,010 linear feet of SRA cover	None known	Carried forward to the third-stage evaluation because impacts on vegetation are minimized
Stream Restoration	Yes	$183 4 million	Yes	Yes	8.0 acres wetlands, 6.2 acres riparian vegetation and over 2,500 linear feet of SRA cover	Uncertain[b]	Removed because of environmental impacts and regulatory uncertainty regarding necessary mitigation
No-Project	No[c]	$200 million in flood damages	Yes	Yes	- Degraded and discontinuous riparian corridor would remain - Moderate wetland and wildlife habitat would remain or worsen - Degraded fish habitat would remain or worsen	None known	Does not meet project purpose. Carried forward to third-stage evaluation because of NEPA/CEQA requirements to address the No-Project alternative

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[a] Cost is estimated in 1995 dollars.

[b] Regulatory uncertainty exists concerning necessary mitigation, and the permit process is uncertain.

[c] Flooding would still occur under alternative.

Chapter 5. Third-Stage Screening Evaluation Results

[To be completed after receipt of comment on draft EIR/EIS.]

Chapter 6. Mitigation for the Least Environmentally Damaging Practicable Alternative

[To be completed after receipt of comment on draft EIR/EIS.]

Chapter 7. Compliance with Section 404 (b)(1) Guidelines

[To be completed after receipt of comment on draft EIR/EIS.]

Attachment 1: Wetland Delineation Information

DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, CORPS OF ENGINEERS
333 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94105-2197

REPLY TO
ATTENTION OF:

SCWD6SEP26'96PM 2:18

JUL 22 1996

ORIGINAL DOCUMENT IN FILES

Regulatory Branch (1145b)

SUBJECT: File Number 17776S18

Ms. Louisa Squires
Santa Clara Valley Water District
Environmental Planning Division
5750 Almaden Expressway
San Jose, California 95118-3686

Dear Ms. Squires:

Thank you for your submittal of 28 August, 1995, requesting confirmation of the extent of Corps of Engineers jurisdiction for the Upper Guadalupe River Flood Control Project in the City of San Jose, Santa Clara County, California.

Enclosed are the maps showing the extent and location of Corps of Engineers jurisdiction on April 23, 1996.

We have based this jurisdictional delineation on the current conditions of the site. A change in those conditions may also change the extent of our jurisdiction. This jurisdictional delineation will expire in five years from the date of this letter. However, if there has been a change in circumstances which effects the extent of Corps jurisdiction, a revision may be done before that date.

If you have any questions, please call Bob Smith of our Regulatory Branch at telephone 415-977-8450. Please address correspondence to the District Engineer, Attention: Regulatory Branch, and refer to the file number at the head of this letter.

Sincerely,
ORIGINAL SIGNED
By
Calvin C. Fong
For
Max R. Blodgett
Chief, Construction-Operations
Division

Enclosure

APPENDIX F-A

FISHERIES

Fisheries

Appendix F-A was prepared by The Habitat Restoration Group in 1991 and consists of the following tables:

Table F-A.1	Fish Collected in Guadalupe River in July-September 1986 and June 1987
Table F-A.2	Fish Collected in the Guadalupe River Drainage Upstream of the Alamitos and Los Capitancillos Percolation Ponds, November through December 1986
Table F-A.3	Water Temperatures for Sites on Guadalupe River and Tributaries in 1986 and 1987
Table F-A.4	Turbidity (Secchi Depths) and Dissolved Oxygen at Sites on Canoas Creek and Guadalupe River, 1986
Table F-A.5	Spawning Habitat and Utilization in the Guadalupe River in 1986-1987
Table F-A.6	Estimated Amount and Percentage of Stream in Various Habitat Categories for Sections of the Guadalupe River, June 1987
Table F-A.7	Estimated Amount and Percentage of Potential Steelhead and Salmon Rearing Habitat Present in Sections of the Guadalupe River, June 1987

Appendix F-A. Fisheries

Table F-A.1 Fish Collected in Guadalupe River in July-September 1986 and June 1987

Species	Blossom Hill Road Reach 12	Branham Lane Reach 11C/12	Hillsdale Avenue Reach 10C	Mouth of Canoas Creek Reach 10B	Curtner Avenue Reach 9	Old Almaden Road Reach 9	Willow Glen Way Reach 8	>Alma Avenue Reach 7/8	<Alma Avenue Reach 7	McClellan Avenue Reach 6	West Virgina Street Reach 6	Auzerais Street	Santa Clara Street	St. John Street	Coleman Avenue	Hobson Street	Highway 880 Reach A	Trimble Road
Sacramento sucker (*Catostomus occidentalis*)	(J2)	J1	J4	J4(J4) A4(A4)	J4(J3) A3(A3)	A2(-) J3(-)	(J2) (A3)	J1 A1	J2(J4) A3(A2)	J3 A1	J4(J2) A4(A2)	J1 A1	J2	J4(J2) A3(A2)	J5 A2	J4 A5	J2 A2	J1 A3
California roach (*Lavinia symmetricus*)	(1)		3	4(5)	3(4)	3(3)	(4)	2	4(4)	3	4(4)	3	2	4(4)	5	4	3	2
Hitch (*Lavinia exilicauda*)																3	3	2
Prickly sculpin (*Cottus asper*)	(3)	3	4	2(2)	3(-)	1(1)		1						1	3	3		
Goldfish (*Carassius auratus*)													2	2				
Carp (*Cyprinus carpio*)		J4	J3	A2(A2)										(A1)				
Mosquitofish (*Cambusia affinis*)				3														
Green sunfish (*Lepomis cyanelus*)			3	2														
Largemouth bass (*Micropterus salmoides*)	(J2)	J5	J3															
Pumkinseed (*Lepomis microlophus*)	(A1)	J1																
Pumpkinseed x green sunfish		J1																

Table F-A.2 Fish Collected in the Guadalupe River Drainage Upstream of the Alamitos and Los Capitancillos Percolation Ponds, November through December 1986

	Sites					
				Alamitos Creek		
Species	Meridian Avenue	Guadalupe Creek Hicks Road District Gaage	Hicks Road 1 mile < Dam	Near Via Valiente	Second Bridge < Dam New Almaden	Arroyo Calero > Harry Road
Rainbow trout (*Oncorhynchus mykiss*)		4	3	2	3	2
Sacramento sucker (*Catostomus occidentalis*)	J2	3	3	J4, A1	2	3
California roach (*Hesperoleucus symmetricus*)	2	4	3	4	2	3
Brown bullhead (*Ictalurus nebulosus*)					1	
Prickly sculpin (*Cottus asper*)	1					
Riffle sculpin (*Cottus gulosus*)		5	3			

A = adult.

J = juvenile.

Note: Abundances rated on a scale of 1 - 5, where 1 is rare and 5 is very abundant.

Table F-A.3. Water Temperatures for Sites on Guadalupe River and Tributaries in 1986 and 1987

Site	Dates	Temperatures
Arroyo Calero at Harry Road	29 Oct 86	62 @ 12:35
	17 Dec 86	54 @ 14:10
Alamitos Creek at Bridge 1 miles <Dam	29 Oct 86	62 @ 13:00
	17 Dec 86	50 @ 14:50
Alamitos Creek at McKean Ave.	29 Oct 86	65 @ 12:45
Alamitos Creek near Via Valiente	29 Oct 86	64 @ 12:30
	17 Dec 86	56 @ 12:45
Guadalupe Creek 1 mile >Pheasant Road	29 Oct 86	64 @ 13:30
	18 Nov 86	57 @ 13:40
Below mouth of Pheasant Creek	29 Oct 86	61 @ 13:40
At SCVWD Gage on Hicks Road	18 Nov 86	56 @ 11:45
		58 @ 13:02
Camden Ave.	29 Oct 86	61 @ 14:00
Meridian Ave.	29 Oct 86	64 @ 14:15
	18 Nov 86	61 @ 10:30
>Blossom Hill at Drop Structure (>Reach 12)	17 Nov 86	59 @ 14:00
	25 June 87	72 @ 09:25
		74 @ 12:10
Branham Lane (Reach 12)	5 Sep 86	77 @ 16:30
Hillsdale Ave. (Reach 10C)	26 July 86	77 @ 18:00
	26 July - 13 Aug 86	70 - 80
	13 Aug 86	77 @ 13:35
	8 Sep 86	76 @ 16:40
	13 Aug - 8 Sep 86	68 - 80
	11 Oct 86	68 @ 17:40
	8 Sep - 11 Oct 86	60 - 76
Canoas Creek at Snell Rd.	13 Aug 86	76 @ 15:00

Table F-A.3. Continued

Site	Dates	Temperatures
Canoas Creek at Almaden Exp.	26 July 86	73 @ 13:00
	13 Aug 86	74 @ 14:00
	26 July - 13 Aug 86	63 - 79
	8 Sep 86	74 @ 16:20
	13 Aug - 8 Sep 86	62 - 77
	11 Oct 86	69 @ 17:25
	25 June 87	75 @ 14:30
		77 @ 16:50
Curtner Ave. (Reach 9)	26 July 86	65 @ 10:00
	13 Aug 86	73 @ 14:15
	26 July - 13 Aug 86	63 - 79
	8 Sep 86	73 @ 16:10
	13 Aug - 8 Sep 86	62 - 77
	11 Oct 86	69 @ 17:00
	8 Sep - 11 Oct 86	59 - 74
	26 June 87	64 @ 10:15
Old Almaden >Pine Ave. (Reach 9)	5 Sep 86	68 @ 14:20
	8 Sep 86	70 @ 16:00
	5 Sep - 8 Sep 86	64 - 73
	11 Oct 86	64 @ 16:35
	8 Sep - 17 Nov 86	56 - 73
	17 Nov 86	60 @ 13:45
	21 Nov 86	63 @ 16:00
	17 June 87	68 @ 15:15
Willow Glen Way (Reach 9)	26 June 87	66 @ 13:20
Alma Ave. (Reach 7)	8 Sep 86	67 @ 15:45
	5 Sep - 8 Sep 86	65 - 73
	11 Oct 86	64 @ 16:05
	8 Sep - 29 Oct 86	58 - 73
	29 Oct 86	63 @ 11:15
	30 June 87	68 @ 10:10
W. Virginia St. (Reach 6)	18 July 86	65 @ 12:00
	13 Aug 86	70 @ 16:25
	30 June 87	70 @ 12:50

Table F-A.3. Continued

Site	Dates	Temperatures
Auzerais Ave.	5 Sep 86	69 @ 09:35
	8 Sep 86	68 @ 15:35
	5 Sep - 8 Sep 86	62 - 72
	11 Oct 86	66 @ 15:45
	8 Sep - 11 Oct 86	57 - 68
St. John St.	13 Aug 86	71 @ 16:25
	7 Aug - 13 Aug 86	67 - 74
	8 Sep 86	69 @ 15:15
	13 Aug - 8 Sep 86	66 - 72
	11 Oct 86	67 @ 15:25
	8 Sep - 11 Oct 86	60 - 69
	30 June 87	73 @ 14:50
Coleman Ave.	5 Sep 86	70 @ 11:25
	8 Sep 86	70 @ 15:00
	5 Sep - 8 Sep 86	66 - 72
	11 Oct 86	67 @ 15:00
	8 Sep - 11 Oct 86	57 - 73
Highway 880	7 Aug 86	74 @ 16:30
	13 Aug 86	75 @ 16:50
	7 Aug - 13 Aug 86	67 - 77
	8 Sep 86	71 @ 14:45
	13 Aug - 8 Sep 86	65 - 76
	11 Oct 86	65 @ 14:40
	8 Sep - 11 Oct 86	61 - 72
Trimble Road	8 Sep 86	72 @ 14:30
	25 Aug - 8 Sep 86	64 - 78
	11 Oct 86	67 @ 14:25
	8 Sep - 11 Oct 86	59 - 74

Note: Ranges (in degrees F) are from maximum-minimum thermometers.

Table F-A.4. Turbidity (Secchi Depths) and Dissolved Oxygen at Sites on Canoas Creek and Guadalupe River, 1986

Site	Date	Secchi Depth (meters)	Dissolved Oxygen (mg/l)
Hillsdale Ave. (Reach 10C)	13 Aug	2+	
	11 Oct	2+	10.5-11.9 @ 17:40
Canoas Creek @ Almaden Expressway	8 Sep	1.1	
	11 Oct	1.3	13.9 @ 17:25
Curtner Avenue (Reach 9)	8 Sep	0.7	
	11 Oct	1.0	10.6 @ 17:00
Old Almaden >Pine Ave. (Reach 9)	8 Sep	0.6	
	11 Oct	0.8	8.7 @ 16:35
Alma Avenue (Reach 7)	8 Sep	0.35	
	11 Oct	0.07*	7.4 @ 16:05
W. Virginia St. (Reach 6)	13 Aug	0.3	
	8 Sep	0.3	
Auzerais Avenue	8 Sep	0.4	
	11 Oct	0.3	8.6 @ 15:45
St. John Street	8 Sep	0.45	
	11 Oct	0.35	8.3 @ 15:25
Coleman Avenue	8 Sep	0.5	
	11 Oct	0.3	8.6 @ 15:00
Highway 880 (Reach A)	8 Sep	0.6	
	11 Oct	0.1*	8.7 @ 14:40
Trimble Road	8 Sep	0.9	
	11 Oct	0.2*	9.9 @ 14:25

*Inchannel disturbance upstream of site.

Table F-A.5. Spawning Habitat and Utilization in the Guadalupe River in 1986-87

Stream Section	**Potential Spawning Sites**	**Utilized Sites**	**Spawning Depressions**
Hwy 280 to W. Virginia St. (Reach 6)	0	0	0
W. Virginia St. to Willow St. (Reach 6 and 7A)	2	1	2-3
Willow St. to Alma Ave. (Reach 7A)	4	3	12
Alma Ave. to Willow Glen Way (Reach 7B and 8)	2	1-2	2-3
Willow Glen Way to Malone Road (Reach 9A)	5	4	12-13
Malone Road to Canoas Creek (Reach 9B and 10A)	0	0	0
Total	**13**	**9-10**	**28-31**

Source: HRG (unpublished data), based on Alley/Smith field survey.

Table F-A.6. Estimated Amount and Percentage ( ) of Stream in Various Habitat Categories for Sections of the Guadalupe River, June 1987

	Habitat Category				
Stream Section	**Pool**	**Pool/ Run**	**Run**	**Run/ Riffle**	**Riffle**
Highway 101 to Highway 880 (Reach A)	(45%)	(26%)	(16%)	(10%)	(4%)
Highway 280 to W. Virginia St. (Reach 6)	800 ft. (56)	100 ft. (7)	175 ft. (12)	300 ft. (21)	50 ft. (4)
W. Virginia St. to Willow St. (Reach 6 and 7A)	1,700 (76)	0 (0)	250 (11)	250 (11)	50 (2)
Willow St. to Alma Ave. (Reach 7B)	1,350 (64)	325 (15)	75 (4)	150 (7)	225 (11)
Alma Ave. to Willow Glen Way (Reach 7C and 8)	1,475 (61)	225 (9)	75 (3)	275 (11)	350 (16)
Willow Glen Way to Malone Rd. (Reach 9A)	1,050 (38)	425 (15)	625 (23)	325 (10)	375 (14)
Malone Rd. to Canoas Creek (Reach 9B and 10AB)	1,850 (51)	200 (5)	625 (18)	625 (17)	300 (8)
Total	**8,225** (56)	**1,275** (9)	**1,825** (13)	**1,925** (13)	**1,350** (9)

Source: HRG (unpublished data).

Table F-A.7. Estimated Amount and Percentage of Potential Steelhead and Salmon Rearing Habitat Present in Sections of the Guadalupe River, June 1987

Stream Section	Section Length (ft)	Rearing Habitat Length (ft)	Rearing as % of Total
Hwy 280 to W. Virginia St. (Reach 6)	1,425	425	30
W. Virginia St. to Willow St. (Reach 6 and 7A)	2,250	500	22
Willow St. to Alma Ave. (Reach 7A)	1,825	575	32
Alma Ave. to Willow Glen Way (Reach 7B and 8)	2,400	600	25
Willow Glen Way to Malone Road (Reach 9A)	2,800	1,200	43
Malone Road to Canoas Creek (Reach 9B and 10A)	3,600	1,425	40
Total	**14,300**	**4,725**	**33**

Source: HRG (unpublished data).

APPENDIX HW-1

REGULATORY AGENCY CONSIDERATIONS

APPENDIX HW-1

REGULATORY AGENCY CONSIDERATIONS

HAZARDOUS WASTE CLASSIFICATION

Materials or wastes (including soil and groundwater) are classified as hazardous, depending on a property or combination of properties they potentially manifest. These properties include toxicity, corrosivity, ignitability, and/or reactivity. Under California law, approximately 800 substances are listed as hazardous by virtue of these properties (California Code of Regulations [CCR], Title 22, Division 4.5, Section 66261.126). California law requires that the generator of a potentially hazardous waste determine if said material is in fact hazardous (CCR, Title 22, Division 4.5, Section 66262.11) and stipulates the criteria and analytical methods for the determination of a waste as hazardous (CCR, Title 22, Division 4.5, Sections 66261.126 and 66261.20 et seq.).

Once a material is classified as a hazardous waste, it is subject to a myriad of local, state and federal regulations governing hazardous waste. For purposes of this investigation, soil and groundwater classified as hazardous waste and removed from the facility must be properly transported and disposed. Briefly, all hazardous waste must be transported under manifest by a licensed hazardous waste hauler to a permitted treatment, storage and disposal facility (TSDF). The generator of the waste is subject to record keeping and notification requirements, and is liable for perpetuity for that waste, regardless of its final disposition.

RELEVANT SOIL CONTAMINATION CLEANUP CRITERIA

Compound-specific concentration levels that have been established for compounds in soils by the State of California to evaluate toxicity are: Total Threshold Limit Concentrations (TTLCs) and Soluble Threshold Limit Concentrations (STLCs). TTLC is defined as ...the concentration of a solubilized, extractable, and nonextractable bioaccumulative, or persistent toxic substance which, if equaled or exceeded in a waste, renders the waste hazardous (CCR, Title 22, Division 4.5, Section 66260.10). STLC is defined as ...the concentration of a solubilized and extractable bioaccumulative or persistent toxic substance which, if equaled or exceeded in a waste, renders the waste hazardous (CCR, Title 22, Division 4.5, Section 66260.10). Presently, there are a total of 38 inorganic and organic substances for which there are published TTLC and STLC values (CCR, Title 22, Division 4.5, Section 66261.24).

A waste or soil is considered hazardous by the State of California if it contains substances at levels exceeding the respective STLC or TTLC (CCR, Title 22, Division 4.5, Section 66261.24). A waste or soil is also considered hazardous if it meets certain toxicity, ignitability, reactivity, or corrosivity criteria. A waste or a soil is classified as extremely hazardous if it contains substances at levels that exceed their TTLC (CCR, Title 22, Division 4.5, Section 66261.113) or if it meets toxicity criteria (CCR, Title 22, Division 4.5, Section 6621.110). If a contaminant in the soil is by itself considered hazardous or extremely hazardous by the State of California, a risk assessment is then needed to determine the magnitude of the risk and the appropriate cleanup level.

Contaminants which are not considered hazardous by the criteria explained above (including approximately 760 substances that are listed as potentially hazardous) may be considered a designated waste due to potential impact to groundwater on a case-by-case basis. The California Regional Water Quality Control Boards (RWQCBs) have developed a Designated Level Methodology (DLM) as a guide in determining if a waste at a given site should be classified as a designated waste, and if so, what cleanup level is needed (RWQCB 1989). The DLM calculations are site-specific and consider the depth to groundwater, type of soil, total pollutant load, and attenuation factors as well as water quality limits for specific constituents within the waste.

STLC criteria are based on leachate concentration and therefore total concentrations measured in soil are not comparable. California law states that samples with contaminant concentrations less than the TTLC but greater than the STLC cannot be classified as nonhazardous unless a waste-extraction test (WET) is performed (CCR, Title 22, Division 4.5, Section 66261.126). In general, actual soluble concentrations of many compounds in soils are less than the total wet-weight compound concentrations, so that as a rule of thumb, a WET test is only performed if the contaminant of concern is detected at a concentration greater than or equal to 10 times the corresponding STLC. However, this can be evaluated by regulatory agencies on a case-by-case basis. Therefore, soils with contaminant concentrations between STLC and TTLC cannot be disposed at a Class III landfill until a WET analysis is performed to determine the contaminant's soluble concentration in soil.

In the case of TPH, the California Department of Health Services (DHS) uses the 1,000 mg/kg TPH limit as a concentration above which soil is deemed hazardous — based on its flammability index — and must be remediated. In addition, the California Regional Water Quality Control Board (RWQCB) — the agency responsible for the protection of groundwater — has guidelines which use 100 mg/kg TPH as a criterion for initiating groundwater investigations associated with leaking underground fuel tanks (LUFTs), and as the soil concentration above which soils should be excavated and/or remediated. This LUFT guidance also discusses application of the DLM. A possible scenario from using the DLM methodology is, if depth to groundwater is shallow, the soil TPH cleanup requirement could be 10 mg/kg or less.

GROUNDWATER CONTAMINATION

In California, groundwater contamination is generally evaluated on a case-by-case DLM basis by regulatory agencies. The DLM considers such criteria as designated land use, sensitive biological receptors, depth to groundwater and beneficial uses of groundwater. The lead agency is California charged with overseeing the environmental protection of the water of California in the RWQCB. Acceptable standards may vary between federal, state and local agencies and may be evaluated by multiple agencies. Thus, a number of different action or remediation levels can be applied to a groundwater contamination area.

There are several potential action standards for groundwater contamination in the State of California. The standard which is usually applied is the strictest of any applicable state or federal standard. The groundwater quality standards, including Federal and California Maximum Contaminant Levels (MCLs) and State Action Levels (SALs) are applicable only where drinking water is concerned or endangered.

At present, the EPA considers drinking water Maximum Contaminant Levels (MCLs), and Federal Ambient Water Quality Criteria (WQC). WQCs are considered Available Applicable or Relevant Appropriate Requirements (ARARs) for groundwater only if they reflect current scientific information and there are no Federal MCLs or State ARARs. The State of California limits the concentration of specified contaminants in the groundwater by state MCLs, SALs, and Proposition 65 (The Safe Drinking Water and Toxics Enforcement Act of 1986). Proposition 65 requires notification of exposure in any environmental media, above the no significant risk level (NSRL), to any chemical known to the State of California to cause cancer or reproductive toxicity. Proposition 65 also prohibits the discharge of these chemicals into drinking water at concentrations above the NSRL. For chemicals known to cause cancer in drinking water, state MCLs are NSRLs. If a state MCL has not been adopted, drinking water action levels (SALs) are NSRLs. If no drinking water action levels have been adopted or the chemical is listed as a reproductive toxin only, and has no other NSRL, the detection limit is the NSRL. For chemicals in media other than drinking water, Proposition 65 provides NSRLs for multiple exposure routes; however, these levels are given in milligrams per day (mg/day), which does not facilitate comparisons by media. The Department of Health Services (DHS), Public Water Supply Branch administers MCLs and SALs. The Health and Welfare Agency administers Proposition 65.

Other standards may be evaluated for comparison if no promulgated standards exist for the given chemical; however, these are applied on a case-by-case basis. These criteria include federal Maximum Contaminant Level Goals (MCLGs), California Applied Action Levels (AAL) for water and air, SALs, state Recommended Drinking Water Action Levels, and STLCs.

Applied Action Levels for water and air are determined by the Department of Toxic Substances Control of the California Environmental Protection Agency. Applied Action Levels are to be used in conjunction with the California Site Mitigation Decision Tree document and are site specific. These can be used as ARARs in some circumstances. State Action Levels for groundwater can be used as standards on a site specific basis or in conjunction with Proposition 65 where an MCL is lacking. These values are also set by the Public Water Supply Branch of the DHS; however, they are in general not enforceable. Recommended Drinking Water Action levels, also determined by the Public Water Supply Branch, are health-based recommended levels. For purposes of this investigation, groundwater analytical data are evaluated in the context of Federal or State of California enforceable action levels for groundwater (MCLs).

REAL PROPERTY TRANSACTIONS

The current owner(s) of real property contaminated by hazardous substances and the owner(s) at the time contamination occurred are strictly, jointly and severally liable under federal and state law for remediation costs (Comprehensive Environmental Response, Compensation, and Liability Act 1980; Superfund Amendment and Reauthorization Act 1986; Elliot et al. 1990). Any intervening owner(s) who knew of the preexisting contamination and failed to disclose its existence to the buyer are also strictly liable. In addition, the original hazardous waste generator, the transporter and/or the site or waste facility operator are liable for the ultimate cleanup costs, even if all procedures followed at the time of disposal met reasonable standards or even then-current regulatory requirements.

Agreements between potentially responsible parties and ultimately responsible parties indemnifying one party or the other from liability do not prevent cost recovery from the indemnified party, should the party that granted the indemnification prove unable to pay for cleanup. Furthermore, each party liable for a portion of site contamination is potentially liable for the entire cost of cleanup.

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provides for a defense against strict liability where the contamination is caused by an act of war, an act of God, or by an unrelated third party that had no contractual agreement with the landowner. CERCLA amendments of 1986 provided the third party defense to include innocent landowners who purchased contaminated property without knowledge of the contamination following a sufficient environmental assessment prior to the purchase. It is therefore significant whether acquiring parties have exercised adequate environmental due diligence and know of hazardous conditions at the time of purchase for purposes of both federal and California cleanup liability (Denny, Jr. and Monahan, eds. 1989).

In order to ensure that potential real property buyers receive all information known to the seller regarding the presence of hazardous substance releases on or beneath the property, statutory disclosure duties have been enacted in California. These disclosure duties limit the availability of the innocent landowner defense. In addition, the California law of constructive fraud provides the risk of future tort liability, as well as statutory liability, for sellers who do not disclose dangerous conditions of which it had knowledge, but which would not be apparent to the purchaser.

APPENDIX V-A

CHECKLIST OF VASCULAR PLANTS, GUADALUPE RIVER

Appendix V-A. Checklist of Vascular Plants Guadalupe River

APPENDIX V-A
CHECKLIST OF VASCULAR PLANTS
GUADALUPE RIVER

SPECIES	COMMON NAME	INDICATOR STATUS
* **ACERACEAE**		
Acer negundo ssp. *californicum*	California Box Elder	FacW
Acer saccharinum[2]	Silver Maple	
* **AGAVACEAE**		
Agave sp.[1]	Century Plant	
Dracaena sp.[2]	Dracaena	
* **AMARANTHACEAE**		
Amaranthus retroflexus[1]	Green Amaranth	FacU
* **ANACARDIACEAE**		
Cotinus coggygria[2]	Smoke Tree	
Pistacia chinensis[2]	Chinese Pistache	
Schinus molle[1]	California Pepper Tree	
Toxicodendron diversilobum	Poison Oak	
* **APIACEAE (UMBELLIFERAE)**		
Conium maculatum[1]	Poison Hemlock	Upl
Foeniculum vulgare[1]	Sweet Fennel	FacU
Sanicula crassicaulis	Pacific Sanicle	
* **APOCYNACEAE**		
Vinca major[1]	Periwinkle	
Nerium oleander[1]	Oleander	
* **ARALIACEAE**		
Hedera helix[1]	English Ivy	
Hedera canariensis[1]	Algerian Ivy	
* **ASTERACEAE**		
Achillea millefolium	Common Yarrow	
Ambrosia psilostachya	Ragweed	
Anthemis cotula[1]	Mayweed	
Artemisia biennis[1]	Sagewort	
Artemisia californica	California Sage	

Artemisia douglasiana	California Mugwort	FacW
Aster chilensis	Aster	Fac
Aster subulatus	Slim Aster	FacW
Baccharis douglasii	Douglas' Baccharis	
Baccharis pilularis ssp. *consanguinea*	Coyote Brush	
Baccharis viminea	Mule Fat	FacW
Bidens frondosa	Stick Tight	FacW
Brickellia californica	Brickellia	
Carduus pycnocephalus[1]	Italian Thistle	Upl
Centaurea solstitialis[1]	Yellow Star Thistle	
Chrysanthemum parthenium[1]	Feverfew	
Cirsium vulgare[1]	Common Thistle	
Conyza canadensis	Horseweed	
Gnaphalium californicum	California Cudweed	
Hemizonia luzulaefolia ssp. *rudis*	Hayfield Tarweed	
Heterotheca oregona	Golden Aster	Upl
Jaumea carnosa	Fleshy Jaumea	
Lactuca serriola[1]	Prickly Lettuce	
Lactuca virosa[1]	Wild Lettuce	
Matricaria matricarioides[1]	Pineapple Weed	
Picris echioides[1]	Bristly Ox-tongue	Fac+
Senecio mikanioides[1]	German Ivy	
Senecio vulgaris[1]	Common Groundsel	
Silybum marianum[1]	Milk Thistle	
Sonchus asper[1]	Prickly Sow Thistle	
Sonchus oleraceus[1]	Common Sow Thistle	
Tragopogon sp.[1]	Salsify	
Xanthium spinosum[1]	Clotbur	
Xanthium strumarium[1]	Cocklebur	Fac

*** BETULACEAE**

Alnus rhombifolia	White Alder	
Betula pendula[2]	White Birch	

*** BIGNONIACEAE**

Catalpa sp.[1]	Catalpa	

*** BRASSICACEAE**

Brassica campestris[1]	Mustard	
Brassica nigra[1]	Black Mustard	Upl
Heliotropium curassavicum	Heliotrope	
Lepidium latifolium[1]	Perennial Peppergrass	
Lepidium nitidum	Pepper Grass	
Lobularia maritima[1]	Sweet Alyssum	

Nasturtium officinale[1]	Watercress	
Raphanus sativus[1]	Wild Radish	Upl
* **CACTACEAE**		
Opuntia occidentalis[1]	Prickly Pear	
* **CAPRIFOLIACEAE**		
Sambucus mexicana	Blue Elderberry	
Symphoricarpos albus	Snowberry	
Viburnum sp.[2]	Viburnum	
* **CARYOPHYLLACEAE**		
Stellaria media[1]	Chickweed	
* **CASUARINACEAE**		
Casuarina cunninghamiana[1]	Beefwood	
* **CELASTRACEAE**		
Euonymus japonica[2]	Evergreen Burning Bush	
Maytenus boaria[2]	Mayten Tree	
* **CHENOPODIACEAE**		
Atriplex patula var. *hastata*	Fat Hen	FacW
Beta vulgaris[1]	Swiss Chard	
Chenopodium album[1]	Lambsquarters	
Chenopodium ambrosioides var. *ambrosioides*[1]	Mexican Tea	
Chenopodium sp.[1]	Goosefoot	
Salsola kali var. *tenuifolia*[1]	Tumbleweed	
* **CONVALLARIACEAE**		
Asparagus densiflorus var. *sprengeri*[1]	Asparagus Fern	
* **CONVOLVULACEAE**		
Convolvulus arvensis[1]	Bindweed	Upl
* **CUCURBITACEAE**		
Marah fabaceus	Wild Cucumber	
* **CUPRESSACEAE**		
Cupressus sp.[1]	Cypress	
Juniperus sp.[2]	Juniper	
Thuja occidentalis[2]	American Arborvitae	
Thuja orientalis[2]	Oriental Arborvitae	

* **CYPERACEAE**		
Carex sp.	Sedge	
Cyperus esculentus	Nut Grass	FacW
Cyperus sp.[2]	Cyperus	
Cyperus alternifolius[1]	Papyrus	
Scirpus acutus	Common Tule	
Scirpus californicus	California Tule	Obl
Scirpus microcarpus	Panicled Bulrush	Obl
* **DIPSACACEAE**		
Dipsacus fullonum[1]	Teasel	Upl
* **EBENACEAE**		
Diospyros virginiana[2]	Persimmon	
* **EQUISETACEAE**		
Equisetum arvense	Common Horsetail	Fac
* **ERICACEAE**		
Xylosma congestum[2]	Xylosma	
* **EUPHORBIACEAE**		
Eremocarpus setigerus	Turkey Mullein	
Euphorbia lathyris[1]	Gopher Spurge	
Ricinus communis[1]	Castor Bean	
* **FABACEAE (LEGUMINOSAE)**		
Albizia julibrissin[2]	Silk Tree	
Ceratonia siliqua[2]	Carob	
Cercis canadensis[1]	Eastern Redbud	
Cytisus sp.[1]	Broom	
Lotus corniculatus[1]	Bird's Foot Trefoil	
Lotus scoparius	Deerweed	
Medicago polymorpha[1]	Bur Clover	
Melilotus albus[1]	White Sweet Clover	FacU
Melilotus indica[1]	Yellow Sweet Clover	
Psoralea physodes	California Tea	
Robinia pseudo-acacia[1]	Black Locust	Fac
Trifolium obtusiflorum	Clover	
Trifolium tridentatum	Tomcat Clover	
Vicia americana	American Vetch	
Vicia dasycarpa[1]	Thick-fruited Vetch	

* **FAGACEAE**		
Quercus agrifolia	Coast Live Oak	
Quercus douglasii	Blue Oak	
Quercus ilex[1]	Holly Oak	
Quercus lobata	Valley Oak	
Quercus wislizenii	Interior Live Oak	
* **FUMARIACEAE**		
Fumaria parviflora[1]	Small-flowered Fumitory	
* **GERANIACEAE**		
Erodium botrys[1]	Long-beaked Filaree	
Erodium cicutarium[1]	Red-stemmed Filaree	
Geranium dissectum[1]	Cut-leaved Geranium	Upl
Pelargonium dissectum[2]	Geranium	
* **GINKGOACEAE**		
Ginkgo biloba[2]	Maidenhair Tree	
* **HAMAMELIDACEAE**		
Liquidambar styraciflua[2]	Sweet Gum	
* **HIPPOCASTANACEAE**		
Aesculus californica	California Buckeye	
* **HYDROPHYLLACEAE**		
Pholistoma auritum	Fiesta Flower	
* **IRIDACEAE**		
Iris sp.	Iris	
* **JUGLANDACEAE**		
Juglans hindsii	California Black Walnut	
Juglans regia[1]	English Walnut	
* **JUNCACEAE**		
Juncus effusus	Bog Rush	
* **LAMIACEAE**		
Marrubium vulgare[1]	Horehound	
Mentha arvensis var. *lanata*	Field Mint	
Stachys sp.	Hedge Nettle	

* **LAURACEAE**	
Cinnamomum camphora[2]	Camphor Tree
Laurus nobilis[1]	English Bay
Persea americana[2]	Avocado
Umbellularia californica	California Bay
* **LILIACEAE**	
Chlorogalum pomeridianum	Soap Root
* **LOGANIACEAE**	
Buddleia davidii[1]	Summer Lilac
* **LYTHRACEAE**	
Lagerstroemia indica[2]	Crape Myrtle
Lythrum sp.	Loosestrife
* **MAGNOLIACEAE**	
Liriodendron tulipifera[2]	Tulip Tree
Magnolia grandiflora[2]	Magnolia
Magnolia tripetala[2]	Umbrella Tree
* **MALVACEAE**	
Malva neglecta[1]	Mallow
Malva parviflora[1]	Mallow
Sidalcea malvaeflora	Checker Bloom
* **MIMOSACEAE**	
Acacia decurrens[2]	Green Wattle
Acacia longifolia[2]	Golden Wattle
Acacia melanoxylon[2]	Black Acacia
Mimosa sp.[1]	Mimosa
* **MORACEAE**	
Ficus carica[2]	Fig
Morus nigra[2]	Black Mulberry
* **MYOPORACEAE**	
Myoporum laetum[2]	Myoporum
* **MYRTACEAE**	
Callistemon lanceolatus[2]	Lemon Bottlebrush
Eucalyptus globulus[1]	Blue Gum
Eucalyptus sp.[1]	Eucalyptus
Eugenia myrtifolia[2]	Brush-cherry
Myrica cerifera[2]	Wax-myrtle

Myrica gale[2]	Sweet Gale	
Myrica pensylvanica[2]	Bayberry	
Psidium guajava[2]	Guava	
* **OLEACEAE**		
Fraxinus uhdei[2]	Evergreen Ash	
Fraxinus velutina[2]	Ash	
Ligustrum lucidum[1]	Glossy Privet	
Olea europaea[1]	Willow-leaved Olive	
Olea sp.[1]	Olive	
* **ONAGRACEAE**		
Epilobium sp.	Willow Herb	
Epilobium paniculatum	Panicled Willow Herb	Upl
Ludwigia peploides	Creeping Water-primrose	Obl
Oenothera hookeri	Hooker Evening Primrose	
Zauschneria californica	California Fuschia	
* **OXALIDACEAE**		
Oxalis pes-caprae[1]	Bermuda Buttercup	
* **PALMAE**		
Washingtonia sp.[1]	Palm	
Phoenix sp.[1]	Date Palm	
* **PAPAVERACEAE**		
Eschscholzia californica	California Poppy	
* **PINACEAE**		
Cedrus deodara[1]	Deodar Cedar	
Pinus sp.[1]	Pine	
Pinus radiata[1]	Monterey Pine	
* **PITTOSPORACEAE**		
Pittosporum sp.[1]	Pittosporum	
* **PLANTAGINACEAE**		
Plantago lanceolata[1]	English Plantain	
Plantago major[1]	Broad Leaf Plantain	FacW
* **PLATANACEAE**		
Platanus racemosa	Sycamore	

*** POACEAE (GRAMINEAE)**

Arundo donax[1]	Giant Reed	FacW
Avena barbata[1]	Wild Oat	
Avena fatua[1]	Wild Oat	
Avena sativa[1]	Oat	
Bambusa sp.[2]	Bamboo	
Bromus carinatus	California Brome	
Bromus diandrus[1]	Ripgut Brome	Upl
Bromus mollis[1]	Soft Chess	
Cortaderia selloana[1]	Pampas Grass	
Crypsis schoenoides[1]	Swampgrass	
Cynodon dactylon[1]	Bermuda Grass	Fac
Echinochloa crusgalli[1]	Barnyard Grass	FacW
Elymus triticoides	Alkali Rye Grass	Fac
Glyceria leptostachya	Manna Grass	
Hordeum leporinum[1]	Farmer's Foxtail	
Leptochloa fascicularis	Sprangle Top Grass	Obl
Lolium perenne[1]	Italian Ryegrass	Fac
Melica californica	Western Melica	
Oryzopsis miliacea[1]	Ricegrass	Upl
Paspalum dilatatum	Dallis Grass	Fac
Paspalum distichum[1]	Knot Grass	
Phalaris paradoxa[1]	Canary Grass	
Poa annua[1]	Annual Bluegrass	
Polypogon monspeliensis[1]	Rabbitsfoot Grass	FacW
Setaria sp.[1]	Brittle Grass	
Sorghum halepense[1]	Barnyard Grass	FacW
Stipa lepida	Small-flowered Stipa	
Vulpia myuros[1]	Rattail Fescue	

*** PODOCARPACEAE**

Podocarpus gracilior[2]	Fern Pine	
Podocarpus macrophyllus[2]	Yew Pine	

*** POLYGONACEAE**

Eriogonum sp.	Buckwheat	
Polygonum aviculare[2]	Common Knotweed	Fac
Polygonum coccineum var. *pratincola*	Smartweed	
Polygonum hydropiper	Smartweed	Obl
Polygonum hydropiperoides	Swamp Smartweed	Obl
Polygonum punctatum	Water Smartweed	Obl
Rumex conglomeratus	Green Dock	FacW
Rumex crispus[1]	Curly Dock	FacW
Rumex pulcher[1]	Fiddle Dock	

* **PORTULACACEAE**		
Montia perfoliata	Miner's Lettuce	
Portulaca oleracea	Purslane	
* **PRIMULACEAE**		
Anagallis arvensis [1]	Scarlet Pimpernel	
* **PROTEACEAE**		
Grevillea robusta [2]	Silk-oak	
* **RANUNCULACEAE**		
Ranunculus californicus	California Buttercup	
Clematis ligusticifolia	Virgin's Bower	
* **RHAMNACEAE**		
Rhamnus alaternus [1]	Italian Buckthorn	
Rhamnus californica	Coffeeberry	
Rhamnus crocea	Red-berry	
* **ROSACEAE**		
Cydonia oblonga [2]	Quince	
Cotoneaster sp. [1]	Cotoneaster	
Eriobotrya japonica [1]	Loquat	
Heteromeles arbutifolia	Toyon	
Malus sylvestris [2]	Apple	
Photinia sp. [2]	Photinia	
Prunus amygdalus [1]	Almond	
Prunus armeniaca [1]	Apricot	
Prunus cerasifera [2]	Cherry Plum	
Prunus persica [1]	Peach	
Prunus sp. [1]	Flowering Plum	
Pyracantha sp. [1]	Firethorn	
Pyrus kawakamii [2]	Evergreen Pear	
Rosa sp. [2]	Rose	
Rosa californica	California Rose	
Rubus procerus [1]	Himalaya Berry	Fac
Rubus ursinus	Blackberry	
* **RUBIACEAE**		
Galium aparine [1]	Bedstraw	
* **RUTACEAE**		
Citrus limon [2]	Lemon	
Citrus sinensis [2]	Orange	

* **SALICACEAE**		
Populus fremontii	Fremont Cottonwood	FacW
Populus nigra[1]	Lombardy Poplar	
Salix babylonica[1]	Weeping Willow	FacW
Salix hindsiana	Sandbar Willow	
Salix laevigata	Red Willow	
Salix lasiandra	Yellow Willow	Obl
Salix lasiolepis	Arroyo Willow	FacW
* **SAXIFRAGACEAE**		
Escallonia sp.[1]	Escallonia	
* **SCROPHULARIACEAE**		
Kickxia spuria[1]	Round-leaved Fluellin	
Scrophularia californica	California Bee Plant	
Verbascum thapsus[1]	Mullein	
Veronica persica[1]	Persian Speedwell	
Veronica anagallis-aquatica	Brooklime	
* **SIMARUBACEAE**		
Ailanthus altissima[1]	Tree-of-Heaven	
* **SOLANACEAE**		
Datura stramonium	Jimson Weed	
Lycopersicon esculentum[1]	Tomato	
Nicotiana glauca[1]	Tree Tobacco	
Solanum nodiflorum[1]	White-flowered Nightshade	
Solanum umbelliferum	Blue Witch	
Solanum sp.[2]	Blue Potato Plant	
* **SPARGANIACEAE**		
Sparganium eurycarpum	Broad-fruited Burreed	Obl
* **TAMARICACEAE**		
Tamarix parviflora[1]	Tamarisk	
* **TAXODIACEAE**		
Sequoia sempervirens[2]	Coast Redwood	
* **TYPHACEAE**		
Typha angustifolia	Narrow-leaved Cat-tail	Obl
Typha latifolia	Broad-leaved Cat-tail	Obl

*** ULMACEAE**		
Ulmus carpinifolia[1]	Smooth Leaf Elm	
Ulmus procera[1]	English Elm	
*** URTICACEAE**		
Parietaria floridana	Florida Pellitory	
Parietaria judaica[1]	Judean Pellitory	
Urtica holosericea	Hoary Nettle	FacW
*** VISCACEAE (LORANTHACEAE)**		
Phoradendron flavescens var. *villosum*	Oak Mistletoe	
*** VITACEAE**		
Vitis californica	California Wild Grape	

Notes: This checlist was prepared in July 1991.

[1] - indicates non-native plant species

[2] - indicates non-native plant species observed only in the urban forest and/or upland landscape habitats

Key to the Wetland Indicator Status

Obl	-	Obligate Wetland. In natural conditions, these species nearly always occur in wetlands (99% probability).
FacW	-	Facultative Wetland. Plants usually occur in wetlands, but may occur in nonwetland areas (67% - 99% probability).
Fac	-	Facultative. These species will occur in wetlands and nonwetlands equally (50% probability).
FacU	-	Facultative Upland. Plants predominately occur in nonwetlands, but are occasionally found in wetlands (1% - 33% probability).
Upl	-	Upland. These species almost always occur in nonwetlands in natural conditions (99% probability) within the specified region, yet may occur in wetlands of another region.

APPENDIX V-C

GUADALUPE RIVER TREE INVENTORY

Appendix V-C. Guadalupe River Tree Inventory

This appendix consists of the following tables and figures:

Table V-C1. Tree Size, Canopy Closure, and Bank Location Designations Used in Vegetation Sampling

Table V-C2.1 Summary of Trees ≥ 2 Inches DBH, by Reach

Table V-C2.2 Summary of Trees ≥ 2 Inches DBH, by Size Class

Table V-C3.1 Summary of Trees ≥ 20 Inches DBH, by Reach

Table V-C3.2 Summary of Trees ≥ 20 Inches DBH in Reach A, Ross Creek, and Canoas Creek

Table V-C4.1 Reach A Trees ≥ 2 DBH, by Size Class

Table V-C5.1 Reach 6 Trees ≥ 2 Inches DBH, by Bank Location

Table V-C5.2 Reach 6 Trees ≥ 2 Inches DBH, by Size Class

Table V-C5.3 Reach 6 Urban Forest Trees ≥ 2 Inches DBH, by Size Class

Table V-C6.1 Reach 7 Trees ≥ 2 Inches DBH, by Bank Location

Table V-C6.2 Reach 7 Trees ≥ 2 Inches DBH, by Size Class

Table V-C6.3 Reach 7 Urban Forest Trees ≥ 2 Inches DBH, by Size Class

Table V-C7.1 Reach 8 Trees ≥ 2 Inches DBH, by Bank Location

Table V-C7.2 Reach 8 Trees ≥ 2 Inches DBH, by Size Class

Table V-C7.3 Reach 8 Urban Forest Trees ≥ 2 Inches DBH, by Size Class

Table V-C8.1 Reach 9 Trees ≥ 2 Inches DBH, by Bank Location

Table V-C8.2 Reach 9 Trees ≥ 2 Inches DBH, by Size Class

Table V-C8.3 Reach 9 Urban Forest Trees ≥ 2 Inches DBH, by Size Class

Table V-C9.1 Reach 10A Trees ≥ 2 Inches DBH, by Bank Location

Table V-C9.2 Reach 10A Trees ≥ 2 Inches DBH, by Size Class

Table V-C10.1 Reach 10B Trees ≥ 2 Inches DBH, by Bank Location

Table V-C10.2 Reach 10B Trees ≥ 2 Inches DBH, by Size Class

Table V-C11.1 Reach 10C Trees ≥ 2 Inches DBH, by Bank Location

Table V-C11.2 Reach 10C Trees ≥ 2 Inches DBH, by Size Class

Table V-C12.1 Reach 11A Trees ≥ 2 Inches DBH, by Bank Location

Table V-C12.2 Reach 11A Trees ≥ 2 Inches DBH, by Size Class

Table V-C13.1 Reach 11B Trees ≥ 2 Inches DBH, by Bank Location

Table V-C13.2 Reach 11B Trees ≥ 2 Inches DBH, by Size Class

Table V-C14.1 Reach 11C Trees ≥ 2 Inches DBH, by Bank Location

Table V-C14.2 Reach 11C Trees ≥ 2 Inches DBH, by Size Class

Table V-C15.1 Reach 12 Trees ≥ 2 Inches DBH, by Bank Location

Table V-C15.2 Reach 12 Trees ≥ 2 Inches DBH, by Size Class

Table V-C16.1 Guadalupe Creek Trees ≥ 2 Inches DBH, by Bank Location

Table V-C16.2 Guadalupe Creek Trees ≥ 11 Inches DBH, by Size Class

Table V-C17.1 Ross and Canoas Creek Trees ≥ 2 Inches DBH, by Bank Location

Table V-C17.2 Ross Creek Urban Forest Trees ≥ 2 Inches DBH, by Size Class

Table V-C17.3 Canoas Creek Urban Forest Trees ≥ 2 Inches DBH, by Size Class

Figure V-C1 Typical Cross Section Showing Bank Locations

Figure V-C2 Frequency of Common Trees in Nine Size Classes

Figure V-C3 Frequency of Fremont Cottonwood by Bank Location

Figure V-C4 Size-Age Relationships in Fremont Cottonwood

Figure V-C5 Size-Age Relationships in California Sycamore

Table V-C1. Tree Size, Canopy Closure, and Bank Location Designations Used in Vegetation Sampling

TREE SIZE CLASS DESIGNATIONS

Size Class	Diameter (inches)
2	2-<6
3	6-<11
4.1	11-<15
4.2	15-<20
4.3	20-<24
5.1	24-<30
5.2	30-<40
5.3	40-<50
6.0	>50

CANOPY CLOSURE DESIGNATIONS

Closure Class	Cover (%)
2	10-25 (sparse)
3	25-40 (open)
4	40-60 (moderate)
5	60+ (dense)

BANK LOCATION DESIGNATIONS

(See Figure V-C1)

Location	Description
A	Channel Bottom
B	Toe of Slope
C	Lower Slope
D	Mid Slope
E	Upper Slope
F	Top of Bank

Table V-C2.1. Summary of Trees ≥2 Inches DBH, by Reach

REACH	A		6		7		8		9		10A		10B		10C		11A		11B		11C		12		GUAD. CREEK		
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**SE**	**NW**	**TOTAL**
Box Elder			4	13	60	92	34	26	84	55	6	6										21	2				403
Acacia*			17		3	4	2		3	2		2		1			2										36
Alder					2								9														11
Buckeye									38	2						56	44				19			17		2	178
Tree-of-Heaven*	2							2		1		2	58		12												77
Cedar*								1																			1
Eucalyptus*		96	13	53	1	19	8	11	3					18	2		12	18	7	79			24	2		2	368
Ca. Black Walnut	45	34	36	53	52	45	23	4	93	123	14	17	10		92	44	92	22	5		31	13	2	6		10	866
English Walnut*			6	1	10	2	3	4	21	16	2	4			7	9	17							1			103
Olive*	6										1			9						3							19
Pine*		36			13	8	5		5	5		7		15			4						41	1			140
Sycamore	5		6		5	2		2	22	6	25	21	46	12	22	44	12	59	27	5	15	20	39	102	75	150	722
Cottonwood	146	121	60	185	122	120	111	57	150	231	8	22	4			2	11	12				25			6		1,393
Poplar*						1						140		11									2				154
Prunus*	26	28	19	22	21	2	22		104	62	20	4	29	6		14	26	17	4			4	31	91			552
Coast Live Oak			1	1	1					4		2	1	17	6	5	17	22	9		2	1			11	2	102
Valley Oak									3	2			7			6	4	4			3	1	2	1	2	17	52
Black Locust*	12	53	7		41	12	16	23	223	334	129	47	3	8	21	37	361	15	2		233	8					1,585
Weeping Willow*	4	9														17		12	4						11		57
Blue Elderberry	35	25	4	16	36	67	40	19	71	64	8	6	15		22	73	55	17	5		101		22	20		16	737
Willow	77	44	81	34	53	52	7	15	9	30		7	22	2	11	12	14	4	5		18	8	122	61	5	4	697
Pepper Tree*	35	45	44	7	7	3			10	4		2	4	20	12		4	6	12							2	217
Redwood*		362				5	2		2	1		3	5	63										1			444
Elm*					6	21				26			4	7	7	5	5	4									85
Prickly Pear*																				10							10
Bay									1	1						2	2	5									11
Palm*			6						1						1												8
Fig*			3				2											1									6
Pyracantha*			2																								2
Cypress*						9	4	2	4	1							7										27
Loquat*						5																					5

Table V-C2.1. Continued

REACH	A		6		7		8		9		10A		10B		10C		11A		11B		11C		12		GUAD. CREEK		
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**SE**	**NW**	**TOTAL**
Privet*					23	6			4	1													2				36
Apple*					2																2						4
Pear*					5		1										1										7
Dracena*									2														14				16
Tamarisk*																								8			8
Tree Tobacco*											1																1
Monterey Pine*		22										7		24		10											63
Int. Live Oak																										1	1
Blue Oak																										11	11
Almond*																		10	3	2							15
Beefwood*																											0
Deodar Cedar*														7	15		1										23
Myoporum*														1			3										4
Mulberry*	122																3										125
Planetree*														3													3
Douglas Fir*									1																		1
Holly Oak*	273	20																									293
TOTAL	**788**	**895**	**309**	**385**	**463**	**475**	**280**	**166**	**854**	**971**	**214**	**299**	**217**	**224**	**230**	**336**	**697**	**228**	**83**	**99**	**424**	**101**	**314**	**311**	**99**	**217**	**9,679**

TOTAL TREES:		
	East Bank:	4,873
	West Bank:	4,490
	Subtotal:	**9,363**
	Southeast Bank:	99
	Northwest Bank:	217
	TOTAL:	**9,679**

* non-native species

Table V-C2.2. Summary of Trees ≥2 Inches DBH, by Size Class

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Box Elder	45	80	96	66	34	56	15	21		1								
Acacia*	8	1	14	4	3	3	1		1			1						
Alder	6		3						1				1					
Buckeye	65	50	31	21	2	6	2		1									
Tree-of-Heaven*	50	2	19	2	1	1												
Cedar*						1												
Eucalyptus*	8	45	19	30	23	19	5	25	6	12	2	23	1	16	3	15	3	15
Ca. Black Walnut	114	81	182	118	84	79	35	25	12	12	6	4	6	2	8	6	3	1
English Walnut*	19	5	19	10	15	13	1	4	2	1	9		1	3				1
Olive*	1	5		5		2												
Pine*	7	6	30	5	17	14	5	9	3	1	6	1						
Sycamore	51	68	50	70	45	52	29	41	13	7	15	15	6	8	6	4	4	8
Cottonwood	67	133	84	126	90	127	87	99	53	78	38	42	29	26	13	19	2	5
Poplar*	2	33		52		48		9		6		3						
Prunus*	200	159	68	57	7	5	2											
Coast Live Oak	12	34	4	5	9	3	5	2	2		1	1	1	4	2		1	2
Valley Oak	2	2	5	6	7	2	1	2	2	2	1		1					
Black Locust*	419	91	418	244	165	111	20	28	6	9	2	1	2		1		3	
Weeping Willow*	11	1		17	1	5	1	4				1						1
Blue Elderberry	222	108	92	107	40	42	14	18	4	7	5		1					
Willow	243	113	67	63	22	27	7	9		9	1	3			1			
Pepper Tree*	9	10	37	12	32	3	9	7	5	1	1	3		5				1
Redwood*	2	35	2	22	2	12	2	2	2	2		4						
Elm*	11	10	4	25	2	19	4	7	1	2								
Prickly Pear*		10																
Bay	2	5	1	3														
Palm*			1		2		1		1				2		1			

Table V-C2.2. Continued

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Fig*	3		3															
Pyracantha*			2															
Cypress*		4	2	5	2	4		2	1									
Loquat*		1		4														
Privet*	24	1	5	6														
Apple*	4																	
Pear*	1		5															
Dracaena*	13		2		1													
Monterey Pine*		9		17		11		2		1		1						
Deodar Cedar*		4	3		2	2	11	1										
Planetree				3														
Myoporum*		1	3															
Tree Tobacco*	1																	
Almond*	3	10		2														
Monterey Cypress*					7													
Mulberry*					3													
Tamarisk*		8																
Douglas Fir*					1													
TOTAL	**1,625**	**1,125**	**1,271**	**1,107**	**619**	**667**	**257**	**317**	**116**	**151**	**87**	**103**	**51**	**64**	**35**	**44**	**16**	**34**

TOTAL TREES:	East Bank:	4,077
	West Bank:	3,612
	TOTAL:	**7,689**

*non-native species

Table V-C3.1. Summary of Trees ≥20 Inches DBH, by Reach

REACH	6		7		8		9		10A		10B		10C		11A		11B		11C		12		
BANK	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	TOTAL
Box Elder								1															1
Acacia*							1	1															2
Alder			2																				2
Buckeye																			1				1
Eucalyptus*	4	26		5	5	4									1	1		43			5	2	96
Black Walnut	3	1	1		2		6	12	1	6			2	3	14	3			6				60
English Walnut*		1								2			1	2	11								17
Cypress*				1			1																2
Pine*			1	1	4		2	1													2		11
Sycamore	4			1		2	8	1	6	2	2	2	7	13	3	2	2		5	1	6	18	85
Cottonwood	14	42	27	29	39	18	47	74	4						4	1				6			305
Poplar*										9													9
Coast Live Oak		1						4						1	6	2			1				15
Valley Oak								1			1								1		2	1	6
Black Locust*							8	8	1					2	5								24
Blue Elderberry						2	3	3					1	1	5				1			1	17
Weeping Willow*																2							2
Willow		1	2	2		6		2						1									14
Pepper Tree*	2			1			2	3		2		3					2						15

Table V-C3.1. Continued

REACH	6		7		8		9		10A		10B		10C		11A		11B		11C		12		
BANK	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	TOTAL
Redwood*				1	2	1				1		3											8
Elm*												1	1			1							3
Palm*	3						1																4
Monterey Pine*										1		1											2
TOTAL	**30**	**72**	**33**	**41**	**52**	**33**	**79**	**111**	**12**	**23**	**3**	**10**	**12**	**23**	**49**	**12**	**4**	**43**	**15**	**7**	**15**	**22**	**701**

TOTAL TREES: East Bank: 304
West Bank: 397

TOTAL: 701

* non-native species

Table V-C3.2. Summary of Trees ≥20" DBH in Reach A, Ross Creek, and Canoas Creek

SPECIES	REACH A EAST BANK	REACH A WEST BANK	ROSS CREEK	CANOAS CREEK
Eucalyptus*		12		
Ca. Black Walnut	2			
Monterey Pine*		6		
Pinus*			2	
Cottonwood	35	26		
Weeping Willow*	3			
Willow	8	5		
Pepper Tree*		1		
Redwood*		6		
TOTAL	**48**	**56**	**2**	**0**
TOTAL TREES:	**106**			

* non-native species

Table V-C4.1. Reach A Trees ≥2 DBH, by Size Class

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Tree-of-Heaven*			2															
Eucalyptus*		1		19		19		45		9		3						
Ca. Black Walnut	23	23	17	6	2	4	1	1			1		1					
Mulberry*			52		70													
Olive*	6																	
Monterey Pine*				3		5		8		5		1						
Pine*				6		14		16										
Sycamore			4				1											
Cottonwood	2	41	23	27	45	15	41	12	21	14	8	8	5	4	1			
Prunus*	16	18	10	9		1												
Holly Oak*	114	11	158	9	1													
Black Locust*	1	50	11	3														
Weeping Willow*		2				7	1		1				2					
Blue Elderberry	21	16	12	7	2	2												
Willow	15	2	15	5	19	13	20	19	4	1	4	3						1
Pepper Tree*	9	6	19	24	5	9	2	5		1								
Redwood*		86		165		73		32		4		1		1				
TOTAL	**207**	**256**	**323**	**283**	**144**	**162**	**66**	**138**	**26**	**34**	**13**	**16**	**8**	**5**	**1**	**0**	**0**	**1**

TOTAL TREES:	East Bank:	788
	West Bank:	895
	TOTAL:	**1,683**

*non-native species

Table V-C5.1. Reach 6 Trees ≥2" DBH, by Bank Location

BANK LOCATION	**A**		**B**		**C**		**D**		**E**		**F**		**F[1]**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**TOTAL**
Box Elder						2		11	4				2	19
Acacia*									6		11		22	39
Eucalyptus*				2		12	3	4	4	21	6	14	2	68
Fig*											3		11	14
Ca. Black Walnut			1	2	3	5	18	6	12	36	2	4		89
English Walnut*							4		1		1	1	10	17
Sycamore									3		3		2	8
Cottonwood			5	19	26	79	21	71	2	16	6			245
Prunus*					1		3	8	12	14	3		59	100
Coast Live Oak								1			1		2	4
Black Locust*									7					7
Blue Elderberry						1		10	4	5				20
Willow				2	54	18	17	5	2	9	8		1	116
Pepper Tree*					1		2	1	8	4	33	2	3	54
Pyracantha*									2					2
Palm*									1		5		11	17
Redwood*													12	12
Tree-of-Heaven*													30	30

Table V-C5.1. Continued

BANK LOCATION	A		B		C		D		E		F		F[1]	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**TOTAL**
Silk Tree*													4	4
Bottlebrush*													4	4
Catalpa*													2	2
Carob*													1	1
Deodar Cedar*													1	1
Cedar*													2	2
Camphor Tree*													6	6
Citrus*													26	26
Persimmon*													2	2
Loquat*													16	16
Brush Cherry*													3	3
Tulip Tree*													1	1
Glossy Privet*													5	5
California Privet*													1	1
Southern Magnolia*													1	1
Apple*													5	5
Umbrella Tree*													1	1
Myrtle*													1	1
Olive*													5	5

Table V-C5.1. Continued

BANK LOCATION	A		B		C		D		E		F		F^1	
BANK	E	W	E	W	E	W	E	W	E	W	E	W	E	TOTAL
Avocado*													10	10
Pine*													4	4
Fern Pine*													1	1
Pomegranate*													1	1
Blue Potato Tree*													1	1
Cypress*													11	11
TOTAL	**0**	**0**	**6**	**25**	**85**	**117**	**68**	**117**	**68**	**105**	**82**	**21**	**282**	**976**

RIPARIAN CORRIDOR TREES:
East Bank: 309
West Bank: 385

TOTAL IN RIPARIAN CORRIDOR: **694**

EAST BANK, URBAN FOREST: **282**

* non-native species

F^1 - Urban Forest, east bank

Table V-C5.2. Reach 6 Trees ≥2" DBH, by Size Class

SIZE CLASS	**2.0**		**3.0**		**4.1**		**4.2**		**4.3**		**5.1**		**5.2**		**5.3**		**6.0**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Box Elder	2		2	4				9										
Acacia*	5		10		2													
Eucalyptus*		4	4	4	4	11	1	8	1	2	1	6		5	2	7		6
Fig*			3															
Ca. Black Walnut	1	3	13	20	14	28	5	1	2	1	1							
English Walnut*	4		1		1									1				
Sycamore					2								1		3			
Cottonwood	13	47	10	38	6	31	14	26	10	25	3	9		3	1	5		
Prunus*	11	12	6	9	2	1												
Coast Live Oak			1															1
Black Locust*			2		4		1											
Blue Elderberry	1		2	7	1	8		1										
Willow	60	8	7	10	13	14	1	1				1						
Pepper Tree*		2	10	3	25		7	2	2									
Pyracantha*			2															
Palm*					2		1		1				1		1			
TOTAL	**97**	**76**	**73**	**96**	**77**	**93**	**30**	**48**	**16**	**28**	**5**	**16**	**2**	**9**	**7**	**12**	**0**	**7**

TOTAL TREES:	East Bank:	307
	West Bank:	385
	TOTAL:	**692**

*non-native species

Table V-C5.3. Reach 6 Urban Forest Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0	3.0	4.0	5.0	6.0
Acacia*		18	3	1	
Box Elder		1			1
Tree-of-Heaven*	23	6			1
Silk Tree*	4				
Bottlebrush*	4				
Catalpa*	2				
Carob*			1		
Camphor Tree*	1		5		
Citrus*	23	3			
Cypress*	10		1		
Persimmon*	2				
Loquat*	5	11			
Brush Cherry*	3				
Eucalyptus*	2				
Fig*	4	7			
English Walnut*		8	1	1	
Privet*	5	1			
Tulip Tree*		1			
Magnolia*			1		
Apple*	4	1			
Umbrella Tree*	1				
Myrtle*	1				
Olive*		5			
Avocado*	2	6	2		
Palm*			3	7	1
Pine*	1	2	1		
Sycamore		1	1		
Fern Pine*	1				
Prunus*	43	16			
Pomegranate*	1				
Coast Live Oak			2		
Willow		1			
Pepper Tree*	1		1	1	
Redwood*		12			
Blue Potato Tree*	1				
Cedar*	2				
Deodar Cedar*			1		
TOTAL	**146**	**100**	**23**	**10**	**3**

TOTAL TREES IN URBAN FOREST: 282

*non-native species

Table V-C6.1. Reach 7 Trees ≥2" DBH , by Bank Location

BANK LOCATION	A		B		C		D		E		F		F'	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**TOTAL**
Box Elder				1	6	17	14	33	34	37	6	4	3	155
Acacia*								1	3	3			4	11
Alder			2											2
Cypress*										3		6		9
Loquat*										5				5
Eucalyptus*			1					12		7			7	27
Ca. Black Walnut			9	5	10	5	23	23	5	6	5	6	7	104
English Walnut*								1	6	1	4		7	19
Privet*							8		15	6				29
Apple*											2			2
Pine*									4	2	9	6	7	28
Sycamore							3		2	2				7
Cottonwood			43	17	52	53	20	42	7	8				242
Poplar*						1								1
Prunus*					1				15	2	5		11	34
Pear*									1		4			5
Coast Live Oak							1							1
Black Locust*			1		19		13	8	8	4				53
Blue Elderberry			1		2	9	9	27	23	31	1			103
Willow			5	20	18	3	22	9	8	20				105
Pepper Tree*							5	2	2			1	2	12
Redwood*										4		1		5

Table V-C6.1. Continued

BANK LOCATION	**A**		**B**		**C**		**D**		**E**		**F**		**F[1]**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**TOTAL**
Elm*						2	2	19	4				3	30
Palm*													1	1
Beefwood*													1	1
Camphor Tree*													3	3
Aust.Brush Cherry*													1	1
Silk Oak*													2	2
Mayten Tree*													1	1
TOTAL	**0**	**0**	**62**	**43**	**108**	**90**	**120**	**177**	**137**	**141**	**36**	**24**	**60**	**998**

RIPARIAN CORRIDOR TREES:	
East Bank:	463
West Bank:	475
TOTAL IN RIPARIAN CORRIDOR:	**938**
EAST BANK, URBAN FOREST:	**60**

* non-native species

F[1]- Urban Forest, top of east bank only

Table V-C6.2. Reach 7 Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W
Box Elder	11	59	34	23	8	10	7	1										
Acacia*			3	1		3												
Alder									1				1					
Cypress*		1		3		4		1										
Loquat*		1		4														
Eucalyptus*		2	1	7		2		3		1		2						2
Ca. Black Walnut	3	19	29	13	15	9	4	4			1							
English Walnut*	5	1	5	1														
Privet*	22		1	6														
Apple*	2																	
Pine*		2	2	1	7		3	4	1			1						
Sycamore	4				1	1						1						
Cottonwood	10	17	33	29	22	20	30	25	9	17	6	10	9	1	1	1	2	
Prunus*	20		1	2														
Pear*	1		4															
Coast Live Oak	1																	
Black Locust*	33	6	6	6	2													
Blue Elderberry	27	34	9	28		5												

Table V-C6.2. Continued

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Willow	26	29	18	19	4	2	3				1	2			1			
Pepper Tree*	1		6	2														1
Redwood*						3		1				1						
Elm*	6	5		8		8												
TOTAL	**172**	**176**	**152**	**153**	**59**	**67**	**47**	**39**	**11**	**18**	**8**	**17**	**10**	**1**	**2**	**1**	**2**	**3**

TOTAL TREES:	East Bank:	463
	West Bank:	475
	TOTAL:	**938**

*non-native species

Table V-C6.3. Reach 7 Urban Forest Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0	3.0	4.0	5.0	6.0
Acacia*	4				
Box Elder		1	2		
Camphor Tree*	2	1			
Eucalyptus*		3	4		
Brush Cherry*		1			
Silk Oak*			2		
Ca. Black Walnut	2	1	4		
English Walnut*	2	1	4		
Pine*			7		
Prunus*	9	1	1		
Pepper Tree*		1	1		
Elm*		3			
Palm*	1				
Beefwood*	1				
Mayten Tree*		1			
TOTAL	**21**	**14**	**25**		

TOTAL TREES IN URBAN FOREST: 60

*non-native species

Table V-C7.1. Reach 8 Trees ≥2" DBH, by Bank Location

BANK LOCATION	**A**		**B**		**C**		**D**		**E**		**F**		**F^1**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**TOTAL**
Box Elder			7		3		21	19	3	7			1	61
Acacia*											2		3	5
Tree-of-Heaven*										2			45	47
Cedar*												1		1
Cypress*									4	2			9	15
Eucalyptus*							8			8		3	6	25
Fig*									2				1	3
Ca. Black Walnut			1	1	2	2	14	1	6				9	36
English Walnut*											3	4		7
Pine*									1		4		14	19
Sycamore										2				2
Cottonwood	4	1	28	2	68	22	10	32			1			168
Prunus*					10		5		7				23	45
Pear*									1					1
Black Locust*							10	21	6	2			1	40
Blue Elderberry							32	6	7	13	1			59
Willow			1			1	2	3	4	11				22
Redwood*								1		4	2			7

Table V-C7.1. Continued

BANK LOCATION	A		B		C		D		E		F		F[1]	
BANK	E	W	E	W	E	W	E	W	E	W	E	W	E	TOTAL
Fir*													3	3
Norfolk Is. Pine*													1	1
Birch*													1	1
Bottlebrush*													7	7
Camphor Tree*													3	3
Citrus*													14	14
Cotoneaster*													3	3
Persimmon*													2	2
Loquat*													4	4
Privet*													9	9
Saucer Magnolia*													3	3
Apple*													5	5
Mulberry*													2	2
Myoporum*													1	1
Myrtle*													3	3
Olive*													1	1
Avocado*													1	1
Pistache*													7	7

Table V-C7.1. Continued

BANK LOCATION	**A**		**B**		**C**		**D**		**E**		**F**		**F[1]**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**TOTAL**
Palm*													1	1
Pomegranate*													1	1
Pyracantha*													3	3
Arborvitae*													1	1
Elm*													35	35
Pittosporum*													1	1
TOTAL	**4**	**1**	**37**	**3**	**83**	**25**	**102**	**83**	**41**	**51**	**13**	**8**	**226**	**675**

RIPARIAN CORRIDOR TREES:
East Bank: 280
West Bank: 171

TOTAL IN RIPARIAN CORRIDOR: 451

EAST BANK, URBAN FOREST: 224

* non-native species

F[1] - Urban Forest, top of east bank only

Table V-C7.2. Reach 8 Trees ≥2" DBH, by Size Class

SIZE CLASS	**2.0**		**3.0**		**4.1**		**4.2**		**4.3**		**5.1**		**5.2**		**5.3**		**6.0**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Box Elder	6	2	11	9	12	8	5	7										
Acacia*	1		1															
Tree-of-Heaven*		2																
Cedar*						1												
Cypress*			2	2	2													
Eucalyptus*		1		1	2	1	1	4	3		1	1	1	1		2		
Fig*	2																	
Ca. Black Walnut	5		15	1	1	1		2							2			
English Walnut*		1		2	2	1	1											
Pine*			1								4							
Sycamore														2				
Cottonwood	15	4	13	15	35	17	9	5	21	14	7	3	8	1	3			
Prunus*	19		3															
Pear*			1															
Black Locust*	4		6	20	6	1		2										
Blue Elderberry	3	2	11	9	16	6	10			2								
Willow		2	6	4	1	1		2		6								
Redwood*				2		2			2	1								
TOTAL	**55**	**14**	**70**	**63**	**77**	**39**	**26**	**22**	**26**	**23**	**12**	**4**	**9**	**4**	**5**	**2**	**0**	**0**

TOTAL TREES:	East Bank:	280
	West Bank:	171
	TOTAL:	**451**

*non-native species

Table V-C7.3. Reach 8 Urban Forest Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0	3.0	4.0	5.0	6.0
Acacia*	2		1		
Box Elder		1			
Tree-of-Heaven*	42	3			
Norfolk Is. Pine*	1				
Birch*	1				
Bottlebrush*	7				
Camphor Tree*			3		
Cotoneaster*	3				
Cypress*	6	3			
Citrus*	12	2			
Loquat*		4			
Eucalyptus*			6		
Fig*	1				
Ca. Black Walnut		3	3	3	
English Walnut*			2		
Privet*	9				
Saucer Magnolia*	3				
Apple*	3	2			
Mulberry*		2			
Myoporum*	1				
Myrtle*	3				
Olive*	1				
Avocado*			1		
Pistache*	7				
Pine*	3	7	4		
Pittosporum*			1		
Prunus*	17	5	1		
Pomegranate*		1			
Pyracantha*	3				
Black Locust*	1				
Arborvitae*	1				
Elm*	5	3	17	10	
Palm*				1	
Persimmon*	2				
Fir*			3		
TOTAL	**134**	**36**	**42**	**14**	**0**

TOTAL TREES IN URBAN FOREST: 226

*non-native species

Table V-C8.1. Reach 9 Trees ≥2" DBH, by Bank Location

BANK LOCATION	**A**		**B**		**C**		**D**		**E**		**F**		
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**TOTAL**
Box Elder			9	1	10	23	24	29	40	2	1		139
Acacia*									3	1		1	5
Buckeye	7						18	2	13				40
Tree-of-Heaven*								1					1
Cypress*									4	1			5
Dracena*									2				2
Eucalyptus*											3		3
Ca. Black Walnut			6	1	10	37	42	41	31	40	4	4	216
English Walnut*			4		1	5	12	5	4	6			37
Privet*								1			4		5
Pine*								1	5	3		1	10
Sycamore						1	7		13	3	2	2	28
Cottonwood	1		88	36	40	94	16	99	5			2	381
Prunus*						7	17	25	86	30	1		166
Coast Live Oak												4	4
Valley Oak			2				1	2					5
Black Locust*			2	3	25	71	119	157	69	99	8	4	557
Blue Elderberry			3		1		14	26	45	26	8	12	135
Willow			2		5	8	2	15		6		1	39
Pepper Tree*									8	3	2	1	14
Redwood*									2			1	3
Elm*				4		7		13		2			26
Bay									1	1			2
Palm*											1		1
Douglas Fir*											1		1
TOTAL	**8**	**0**	**116**	**45**	**92**	**253**	**272**	**417**	**331**	**223**	**35**	**33**	**1,825**

RIPARIAN CORRIDOR TREES:

East Bank:	854
West Bank:	971
TOTAL:	**1,825**

* non-native species

Table V-C8.2. Reach 9 Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W
Box Elder	24	3	47	12	10	35	3	4		1								
Acacia*		1			1		1		1			1						
Buckeye	25	2	13															
Tree-of-Heaven*						1												
Cypress*	3							1	1									
Dracaena*			2															
Eucalyptus*			2				1											
Ca. Black Walnut	19	18	43	48	16	33	9	12	1	6	3	1		2		3	2	
English Walnut*	5		12	4	4	9		3										
Privet*		1	4															
Pine*			1		1	3	1	1		1	2							
Sycamore	2		4		7	1	1	4	1		5		1				1	1
Cottonwood	20	38	26	35	26	51	31	33	6	19	21	19	12	18	8	13		5
Prunus*	62	27	36	34	4	1	2											
Valley Oak					3			1		1								
Coast Live Oak														4				
Black Locust*	71	51	94	155	45	98	5	22	1	8	1		2		1		3	
Blue Elderberry	43	7	20	21	3	19	1	16		3	3							
Doug Fir*					1													

Table V-C8.2. Continued

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Willow	5	7	4	10		5		6		2								
Pepper Tree*			5		3				1		1	2		1				
Redwood*	2					1												
Elm*		4		15		5		2										
Bay	1			1														
Palm*													1					
TOTAL	**282**	**159**	**314**	**334**	**124**	**262**	**55**	**105**	**12**	**41**	**36**	**23**	**16**	**25**	**9**	**16**	**6**	**6**

TOTAL TREES:	East Bank:	854
	West Bank:	971
	TOTAL:	**1,825**

*non-native species

Table V-C9.1. Reach 10A Trees ≥2" DBH, by Bank Location

BANK LOCATION	A		B		C		D		E		F		
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**TOTAL**
Box Elder			6			5		1					12
Acacia*		2											2
Tree-of-Heaven*						2							2
Ca. Black Walnut			5		2	1	5	8	2	4		4	31
English Walnut*					1	1	1	1				2	6
Pine*										5		2	7
Sycamore					2			4	23	16		1	46
Cottonwood			6		2	22							30
Poplar				27		76		37					140
Prunus*							3		16	4	1		24
Coast Live Oak								2					2
Black Locust*			6	2	34	16	67	8	18	6	4	15	176
Blue Elderberry							4	4		2	4		14
Willow		3				3				1			7
Pepper Tree*										2			2
Redwood*										1		2	3
Olive*											1		1
Tree Tobacco*									1				1
Monterey Pine*										6		1	7
TOTAL	**0**	**5**	**23**	**29**	**41**	**126**	**80**	**65**	**60**	**47**	**10**	**27**	**513**

RIPARIAN CORRIDOR TREES:	
East Bank:	214
West Bank:	299
TOTAL:	**513**

* non-native species

Table V-C9.2. Reach 10A Trees ≥2" DBH, by Size Class

SIZE CLASS	**2.0**		**3.0**		**4.1**		**4.2**		**4.3**		**5.1**		**5.2**		**5.3**		**6.0**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Box Elder			2	4	4	2												
Acacia*				2														
Tree-of-Heaven*				2														
Ca. Black Walnut	4	1	4	8	4		1	2	1	1		2				3		
English Walnut*	1			2	1									2				
Pine*				2		3		2										
Sycamore	1	3	4	3	9	12	5	1	4	1	1	1	1					
Cottonwood	2	21		1			2		3		1							
Prunus*	12	4	8															
Poplar		26		48		48		9		6		3						
Coast Live Oak				1				1										
Black Locust*	32		51	40	43	5	2	2			1							
Blue Elderberry	4		3	4	1			2										
Willow		5		1		1												
Pepper Tree*														2				
Redwood*						2				1								
Olive*	1																	
Tree Tobacco*	1																	
Monterey Pine*						6				1								
TOTAL	**58**	**60**	**72**	**118**	**62**	**79**	**10**	**19**	**8**	**10**	**3**	**6**	**1**	**4**	**0**	**3**	**0**	**0**

TOTAL TREES:	East Bank:	214
	West Bank:	299
	TOTAL:	**513**

*non-native species

Table V-C10.1 Reach 10B Trees ≥2" DBH, by Bank Location

BANK LOCATION	A		B		C		D		E		F		
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**TOTAL**
Acacia*												1	1
Alder			9										9
Poplar												11	11
Tree-of-Heaven*					1		14		3		40		58
Eucalyptus*										4		14	18
Ca. Black Walnut					7				3				10
Valley Oak					4		3						7
Pine*								2		3		10	15
Sycamore							11		34		1	12	58
Cottonwood					4								4
Prunus*							23	1	5		1	5	35
Coast Live Oak									1	1		16	18
Black Locust*					3					8			11
Blue Elderberry							4		11				15
Willow	3	2			5		14						24
Pepper Tree*									4			20	24
Redwood*									5			63	68
Elm*							1	1	3	6			11
Monterey Pine										7		17	24
Plane Tree*												3	3
Olive*												9	9
Deodar Cedar*												7	7
Myoporum*												1	1
TOTAL	**3**	**2**	**9**	**0**	**24**	**0**	**70**	**4**	**69**	**29**	**42**	**189**	**441**

RIPARIAN CORRIDOR TREES:

East Bank:	217
West Bank:	224
TOTAL:	**441**

* non-native species

Table V-C10.2. Reach 10B Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W	E	W
Acacia*				1														
Tree-of-Heaven*	42		16															
Alder	6		3															
Poplar		7		4														
Eucalyptus*		18																
Ca. Black Walnut	8				2													
Olive*		4		4		1												
Pine*		4		2		8		1										
Sycamore	13	10	17		7		7		2					1		1		
Cottonwood	3		1															
Prunus*	20	2	10			3												
Coast Live Oak	1	13				3		1										
Valley Oak			4		2						1							
Black Locust*	1	7	2	1														
Blue Elderberry	7		6		1	1												
Willow	16	2	6															
Pepper Tree*	1	6	3	5		1		5				1		2				
Redwood*		35	2	20	2	4	1	1				3						
Elm*	3	1	1			1		4		1								
Monterey Pine*		8		14		1						1						
Plane Tree*				3														
Deodar Cedar*		4				2		1										
Myoporum*	1																	
TOTAL	**121**	**122**	**71**	**54**	**14**	**25**	**8**	**13**	**2**	**1**	**1**	**5**	**0**	**3**	**0**	**1**	**0**	**0**

TOTAL TREES:	East Bank:	217
	West Bank:	224
	TOTAL:	**441**

*non-native species

Table V-C11.1. Reach 10C Trees ≥2" DBH, by Bank Location

BANK LOCATION	**A**		**B**		**C**		**D**		**E**		**F**		
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**TOTAL**
Buckeye								30		26			56
Tree-of-Heaven*							12						12
Weeping Willow*		14				3							17
Eucalyptus*							2						2
Ca. Black Walnut				19	35	7	20	15	32	3	5		136
English Walnut*				6		1		2	7				16
Monterey Pine*										10			10
Sycamore							5	9	3	13	14	22	66
Cottonwood		2											2
Deodar Cedar*							12		3				15
Prunus*								8		6			14
Coast Live Oak					4		2	1		1		3	11
Black Locust*				24	3	1	18	12					58
Blue Elderberry				34			20	25	2	5		9	95
Willow		3	3			2	8	6		1			23
Pepper Tree*							10		2				12
Elm*							2		5	5			12
Valley Oak				2		4							6
Bay						2							2
Palm*							1						1
TOTAL	**0**	**19**	**3**	**85**	**42**	**20**	**112**	**108**	**54**	**70**	**19**	**34**	**566**

RIPARIAN CORRIDOR TREES:	
East Bank:	230
West Bank:	336
TOTAL:	**566**

* non-native species

Table V-C-11.2. Reach 10C Trees ≥2" DBH, by Size Class

SIZE CLASS	**2.0**		**3.0**		**4.1**		**4.2**		**4.3**		**5.1**		**5.2**		**5.3**		**6.0**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Buckeye		33		17		6												
Eucalyptus*			1		1													
Ca. Black Walnut	43	16	39	14	8	8		4	2	1		1						1
English Walnut*	3	3	1	1	2	2		1		1			1					1
Monterey Pine*		1		3		4		2										
Sycamore	1	5	4	13	4	5	5	8		1	3	8		2	3		2	2
Cottonwood				1		1												
Prunus*		12		2														
Coast Live Oak	1	2		2	4		1					1						
Valley oak		2		3		1												
Black Locust*	13	5	7	21	1	7		2		1		1						
Blue Elderberry	20	41		29	1	2				1	1							
Willow	8	3	3	4		3		1		1								
Pepper Tree*	6		6															
Elm*				1	2	3	4	1	1									
Bay				2														
Palm*			1															
Deodar Cedar			3		2		10											
Tree-of-Heaven*	8		3		1													
Weeping Willow*				14		3												
TOTAL	**103**	**123**	**68**	**127**	**26**	**45**	**20**	**18**	**3**	**6**	**4**	**11**	**1**	**2**	**3**	**0**	**2**	**4**

TOTAL TREES:	East Bank:	230
	West Bank:	336
	TOTAL:	**566**

*non-native species

Table V-C12.1. Reach 11A Trees ≥2" DBH, by Bank Location

BANK LOCATION	A		B		C		D		E		F		
BANK	E	W	E	W	E	W	E	W	E	W	E	W	TOTAL
Acacia*											2		2
Buckeye					5		34		4		1		44
Eucalyptus*					1		4	1	3		4	17	30
Fig*											1		1
Ca. Black Walnut				1	3		32	7	39	12	18	2	114
English Walnut*							1				16		17
Pine*											4		4
Sycamore		2	3	5	3	3	1	31	5	18			71
Cottonwood			11			1		11					23
Prunus*								2	4	15	22		43
Pear											1		1
Coast Live Oak						1	8	6	3	14	6	1	39
Valley Oak							3	4			1		8
Black Locust*					42	14	148	1	112		59		376
Weeping Willow*		11				1							12
Blue Elderberry					4		30	6	14	9	7	2	72
Willow		1	5		6	3	2		1				18
Pepper Tree*								6			4		10
Elm*										4	5		9
Bay							2	5					7
Almond*								10					10
Deodar Cedar*											1		1
Myoporum*											3		3
Mulberry*											3		3
Monterey Cypress*											7		7
TOTAL	**0**	**14**	**19**	**6**	**64**	**23**	**265**	**90**	**185**	**72**	**165**	**22**	**925**

RIPARIAN CORRIDOR TREES:

East Bank:	698
West Bank:	227
TOTAL:	**925**

* non-native species

Table V-C12.2. Reach 11A Trees ≥2", by Size Class

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Acacia*	2																	
Eucalyptus*		8	2	9	8		1										1	1
Ca. Black Walnut	19	16	29	3	19		11		5	3			5		4			
English Walnut*	1				5				2		9							
Pine*	2		1				1											
Sycamore		23		17	4	10	5	7	1		1	1		1			1	
Cottonwood	4		1	4	1	3	1	4	4			1						
Prunus*	25	17	1															
Coast Live Oak		18	2	2	5		4		2		1		1		1		1	2
Black Locust*	90	15	202		54		10		5									
Blue Elderberry	13	9	23	6	11	1	3	1	4		1							
Willow	6		5	3		1	3											
Pepper Tree*		2	4	2		2												
Elm*	2		3	1		2				1								
Valley Oak			1	2	2	1	1	1										
Buckeye	24	2	16		2		2											
Weeping Willow*		1		3		2		4				1						1
Bay	1	5	1															
Almond*		10																
Monterey Cypress*					7													
Deodar Cedar*							1											
Fig*	1																	
Myoporum*			3															
Mulberry*					3													
Pear*	1																	
TOTAL	**191**	**126**	**294**	**52**	**121**	**22**	**43**	**17**	**23**	**4**	**12**	**1**	**6**	**1**	**5**	**0**	**3**	**4**

TOTAL TREES:	East Bank:	698
	West Bank:	227
	TOTAL:	**925**

*non-native species

Table V-C13.1. Reach 11B Trees ≥2" DBH, by Bank Location

BANK LOCATION	A		B		C		D		E		F		
BANK	E	W	E	W	E	W	E	W	E	W	E	W	TOTAL
Eucalyptus*							1	6	6			73	86
Ca. Black Walnut			3		1		1						5
Sycamore					5		3	5	19				32
Prunus*					3				1				4
Coast Live Oak							9						9
Black Locust*											2		2
Blue Elderberry									5				5
Willow			5										5
Pepper Tree*					1		1		10				12
Almond*									3			2	5
Weeping Willow*							4						4
Prickly Pear*						2		8					10
Olive*								3					3
TOTAL	**0**	**0**	**8**	**0**	**10**	**2**	**19**	**22**	**44**	**0**	**2**	**75**	**182**

RIPARIAN CORRIDOR TREES:

East Bank:	83
West Bank:	99
TOTAL:	**182**

* non-native species

Table V-C13.2. Reach 11B Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Eucalyptus*	3	12	3	9	1	5		10		9		14		10		6		4
Ca. Black Walnut			5															
Sycamore	10	2	10	3	4		1		2									
Prunus*	1		2		1													
Coast Live Oak	8		1															
Black Locust*					2													
Blue Elderberry	5																	
Willow	2		3															
Pepper Tree*	1		3		4		2		2									
Almond*	3			2														
Weeping Willow*					1		1											
Prickly Pear*		10																
Olive*		1		1		1												
TOTAL	**33**	**25**	**29**	**15**	**13**	**6**	**4**	**10**	**4**	**9**	**0**	**14**	**0**	**10**	**0**	**6**	**0**	**4**

TOTAL TREES:	East Bank:	83
	West Bank:	99
	TOTAL:	**182**

*non-native species

Table V-C14.1. Reach 11C Trees ≥2" DBH, by Bank Location

BANK LOCATION	**A**		**B**		**C**		**D**		**E**		**F**		
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**TOTAL**
Box Elder								17				4	21
Ca. Black Walnut			2			3	12	10	9		8		44
Apple*									2				2
Sycamore					4	2	3	18	8				35
Cottonwood						24						1	25
Prunus*								1		2		1	4
Coast Live Oak							1		1	1			3
Black Locust*			2		31		156	8	21		23		241
Blue Elderberry							47		42		12		101
Willow			13		1		4	8					26
Valley Oak							2			1	1		4
Buckeye			4				1		14				19
TOTAL	**0**	**0**	**21**	**0**	**36**	**29**	**226**	**62**	**97**	**4**	**44**	**6**	**525**

RIPARIAN CORRIDOR TREES:

East Bank:	424
West Bank:	101
TOTAL:	**525**

* non-native species

Table V-C14.2. Reach 11C Trees ≥2" DBH, by Size Class

SIZE CLASS	**2.0**		**3.0**		**4.1**		**4.2**		**4.3**		**5.1**		**5.2**		**5.3**		**6.0**	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Box Elder		16		4		1												
Ca. Black Walnut	10	6	5	7	5		5		1		1		1		2		1	
Apple*	2																	
Sycamore	1	7	5	7	3	4	1	1	2		2		1					1
Cottonwood		6		3		4		6		3				3				
Prunus*		4																
Coast Live Oak	1	1													1			
Black Locust*	175	7	48	1	8		2											
Blue Elderberry	77		17		6								1					
Willow	7	4	6	4	4													
Valley Oak	2			1								1						
Buckeye	16		2						1									
TOTAL	**291**	**51**	**84**	**27**	**26**	**9**	**8**	**7**	**4**	**3**	**3**	**0**	**4**	**3**	**3**	**0**	**1**	**1**

TOTAL TREES:	East Bank:	424
	West Bank:	101
	TOTAL:	**525**

*non-native species

Table V-C15.1. Reach 12 Trees ≥2" DBH, by Bank Location

BANK LOCATION	**A**		**B**		**C**		**D**		**E**		**F**		
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**TOTAL**
Box Elder					1						1		2
Buckeye								4		13			17
Dracena*									13		1		14
Eucalyptus*							1				23	2	26
Ca. Black Walnut											2	6	8
English Walnut*												1	1
Privet*							2						2
Pine*							6				35	1	42
Sycamore								8	20	32	19	62	141
Poplar					2								2
Prunus*						4	8	87			23		122
Valley Oak											2	1	3
Weeping Willow*					11								11
Blue Elderberry						6	19	12		2	3		42
Willow				1	14	14	104	46			4		183
Redwood*											1		1
Tamarisk*								8					8
TOTAL	**0**	**0**	**0**	**1**	**28**	**24**	**140**	**165**	**33**	**47**	**114**	**73**	**625**

RIPARIAN CORRIDOR TREES:

East Bank:	315
West Bank:	310
TOTAL:	**625**

* non-native species

Table V-C15.2. Reach 12 Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0		3.0		4.1		4.2		4.3		5.1		5.2		5.3		6.0	
BANK	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**	**E**	**W**
Sycamore	19	18	6	27	4	19	4	20	1	5	3	4	2	2		3		4
Buckeye		13		4														
Blue Elderberry	22	15		4						1								
Willow	113	53	9	8														
Tamarisk*		8																
Ca. Black Walnut	2	2		4														
English Walnut*						1												
Eucalyptus*	5		6		7		1		2						1		2	2
Prunus*	30	81	1	10														
Poplar*	2																	
Pine*	5		25		9			1	2									
Weeping Willow*	11																	
Privet*	2																	
Dracaena*	13				1													
Box Elder	2																	
Redwood*							1											
Valley Oak									2	1								
TOTAL	**226**	**190**	**47**	**57**	**21**	**20**	**6**	**21**	**7**	**7**	**3**	**4**	**2**	**2**	**1**	**3**	**2**	**6**

TOTAL TREES:	East Bank:	315
	West Bank:	310
	TOTAL:	**625**

*non-native species

Table V-C16.1. Guadalupe Creek Trees ≥2" DBH, by Bank Location

BANK LOCATION:	**A**		**B**		**C**		**D**		**E**		**F**		
BANK:	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**	**TOTAL**
Buckeye						2							2
Eucalyptus*												2	2
Ca. Black Walnut						1		9					10
Sycamore			6		5	34	8	37	24	1	32	78	225
Cottonwood					6								6
Coast Live Oak					3	1	5	1	1		2		13
Blue Oak										2		9	11
Valley Oak							2	2		3		12	19
Int. Live Oak										1			1
Blue Elderberry						6		5		4		1	16
Willow						1	3	1	1		1	2	9
Pepper Tree*								2					2
TOTAL	**0**	**0**	**6**	**0**	**14**	**45**	**18**	**57**	**26**	**11**	**35**	**104**	**316**

RIPARIAN CORRIDOR TREES:	
Southeast Bank:	99
Northwest Bank:	217
TOTAL:	**316**

* non-native species

Table V-C16.2. Guadalupe Creek Trees ≥11" DBH, by Size Class

SIZE CLASS	**4.1**		**4.2**		**4.3**		**5.1**		**5.2**		**5.3**		**6.0**	
BANK	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**	**SE**	**NW**
Buckeye		1		1										
Eucalyptus*		1		1										
Ca. Black Walnut		1		1		1		3		3		1		
Sycamore	15	39	17	34	10	21	14	16	13	20	3	12	3	8
Cottonwood	3		2		1									
Coast Live Oak			2	1	1		5		3	1				
Blue Oak		2		4		2				3				
Valley Oak				1		6	2	5		1		1		3
Int. Live Oak								1						
Blue Elderberry		12		2		2								
Willow	2	2	3			2								
Pepper Tree*												2		
TOTAL	**20**	**58**	**24**	**45**	**12**	**34**	**21**	**25**	**16**	**28**	**3**	**16**	**3**	**11**

TOTAL TREES:	Southeast Bank:	99
	Northwest Bank:	217
	TOTAL:	**316**

*non-native species

Table V-C17.1. Ross and Canoas Trees ≥2" DBH, by Bank Location

	Ross Creek		Canoas Creek		
BANK:	**North**	**South**	**North**	**South**	**Total**
Apple*	4	1		1	6
Arborvitae*	1				1
Ash*	3	1	8	9	21
Avocado*			1		1
Birch*		4			4
Black Locust*	2				2
Ca. Black Walnut	2				2
Bottlebrush*	1			6	7
Brush Cherry*	1	7			8
Camphor Tree*	1	1			2
Citrus*	7	6	2	14	29
Crepe Myrtle*		2			2
Cypress*	29	91			120
Deodar Cedar*	3				3
Dracena*	5			5	10
Eastern Redbud*		1			1
Elm*	3			5	8
English Walnut*		1		1	2
Eucalyptus*	15	4		1	20
Fern Pine*	2				2
Ginko*	1			2	3
Grewia*		1			1
Guava*				5	5
Hopseed Bush*		2			2
Italian Buckthorn*	4	6			10
Juniper*	13	8	2		23
Liquidambar*		4			4
Loquat*			2	4	6
Magnolia*	3	1			4
Mayten Tree*	2				2
Mulberry*	2	2	2	1	7
Myoporum*	2	2			4
Oleander*	3	1			4
Olive*	5				5
Palm*	4		1		5
Pepper Tree*	1				1
Persimmon*				3	3
Photinia*	2				2

Table V-C17.1. Continued

	Ross Creek		Canoas Creek		
BANK:	**North**	**South**	**North**	**South**	**Total**
Pine*	7	1	1	1	10
Pistache*	2	1			3
Pittosporum*		17			17
Poplar*		16			16
Privet*	7	12	21	5	43
Prunus*	17	14	10	12	53
Pyracantha*	2	1			3
Redwood*	4	7			11
Silver Maple*		1			1
Sycamore		1			1
Viburnum*		2		3	5
Xylosma*	1				1
Yew Pine*	4				4
TOTAL EACH BANK	**165**	**219**	**50**	**76**	**510**

TOTAL EACH CREEK:

Ross Creek:	**384**
Canoas Creek:	**126**

* non-native species

Table V-C17.2. Ross Creek Urban Forest Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0	3.0	4.0	5.0	6.0
Silver Maple*	1				
Bottlebrush*	1				
Deodar Cedar*		2	1		
Camphor Tree*		1	1		
Citrus*	13				
Dracaena*	4	1			
Cypress*	116	3	1		
Brush Cherry*	7	1			
Eucalyptus*	3	11	5		
Ash*	1	1	2		
Ginko*	1				
Ca. Black Walnut	1	1			
Juniper*	21				
Privet*	14	4	1		
Mayten Tree*	2				
Magnolia*	1	3			
Apple*	4	1			
Mulberry*		3	1		
Myoporum*		2	2		
Oleander*	4				
Olive*	4	1			
Photinia*	1	1			
Pistache*	3				
Pittosporum*	17				
Pine*	2	1	3	2	
Sycamore		1			
Yew Pine*	4				
Fern Pine*		2			
Prunus*	22	8	1		
Pyracantha*	3				
Black Locust*	2				
Redwood*	10	1			
Pepper Tree*		1			
Arborvitae*	1				
Elm*	3				
Palm*			4		
Xylosma*	1				
Crepe Myrtle*	2				
Liquidambar*	4				
Poplar*	2	10	4		
Viburnum*	2				
Birch*	4				
Eastern Redbud*	1				
Italian Buckthorn*	9	1			
English Walnut*		1			
Hopseed Bush*		2			
Grevia*	1				
TOTAL	**292**	**64**	**26**	**2**	**0**

TOTAL TREES IN URBAN FOREST: 384
*non-native species

Table V-C17.3. Canoas Creek Urban Forest Trees ≥2" DBH, by Size Class

SIZE CLASS	2.0	3.0	4.0
Bottlebrush*	6		
Guava*	5		
Citrus*	14	2	
Dracaena*	5		
Persimmon*	3		
Loquat*	6		
Eucalyptus*			1
Ash*	4	11	2
English Walnut*			1
Juniper*		2	
Privet*	25		1
Apple*	1		
Mulberry*	1		2
Avocado*		1	
Pine*		1	1
Prunus*	16	6	
Elm*	5		
Viburnum*		3	
Palm*			1
TOTAL	**91**	**26**	**9**

TOTAL TREES IN URBAN FOREST: 126

*non-native species

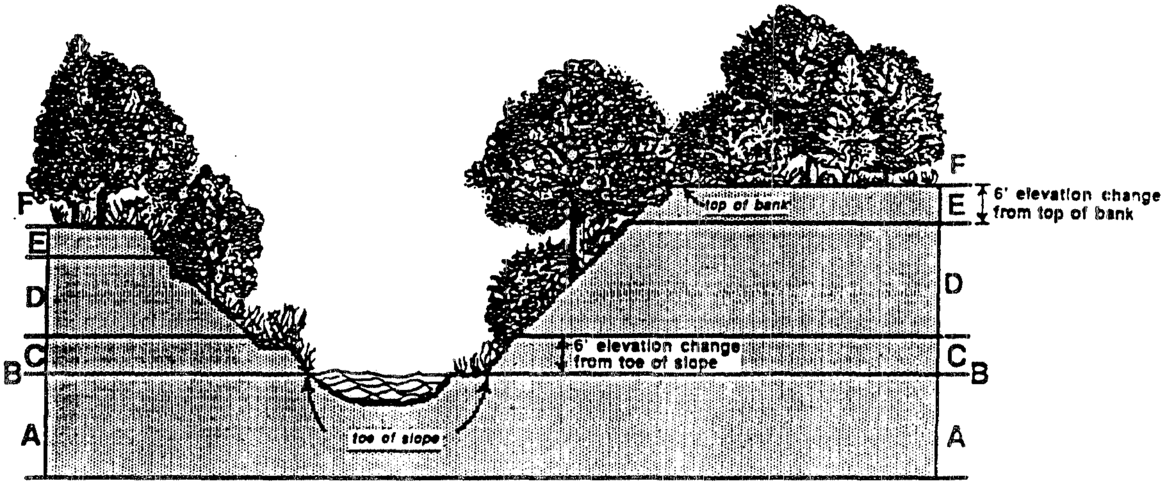

F
E
D
C
B
A
top of bank
F
E
6' elevation change from top of bank
D
6' elevation change from toe of slope
C
B
toe of slope
A

Figure V-C1. Typical Cross Section Showing Bank Locations

Source: Habitat Restoration Group

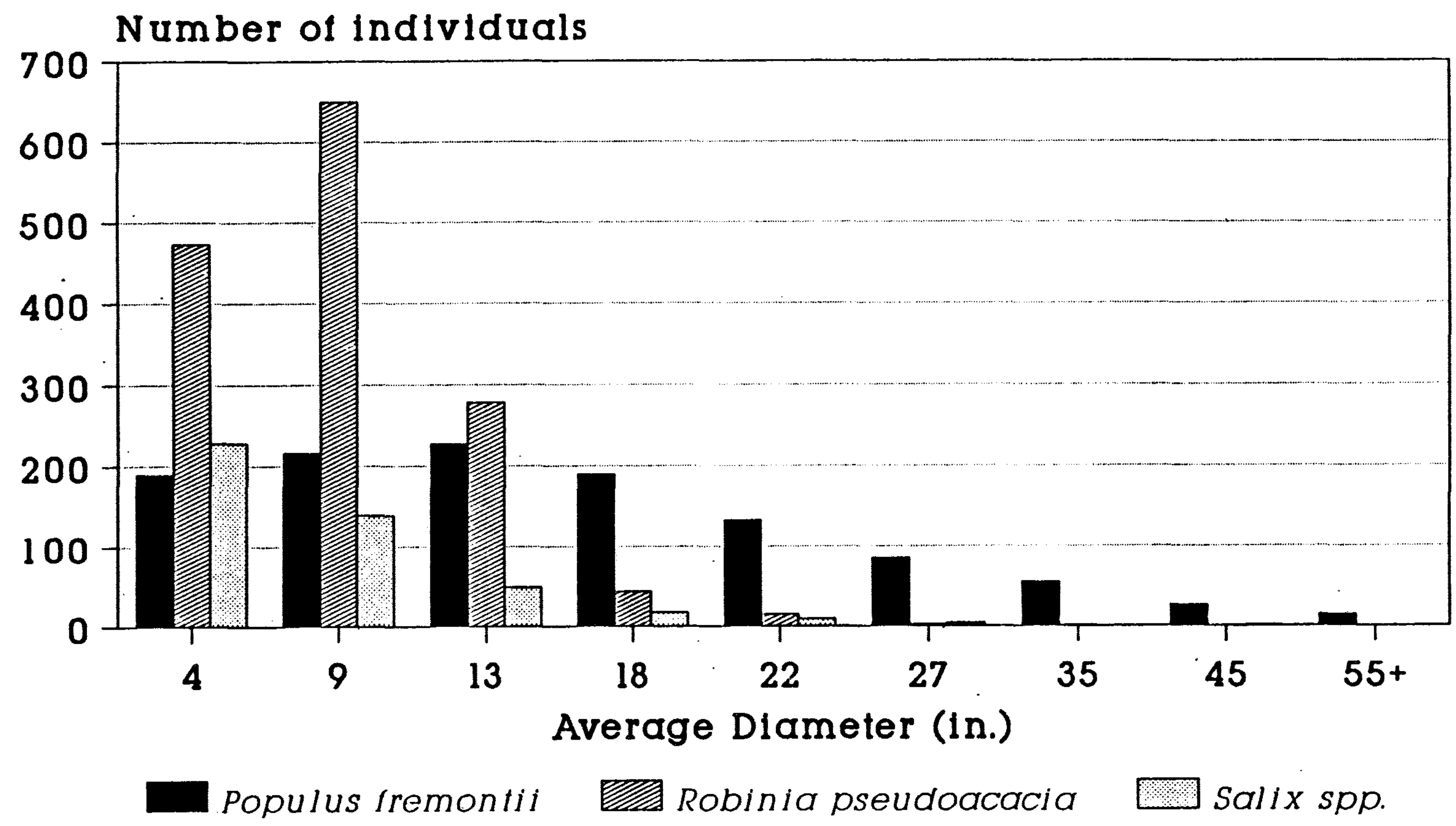


Figure V-C2. Frequency of Common Trees in Nine Size Classes

Source: Habitat Restoration Group

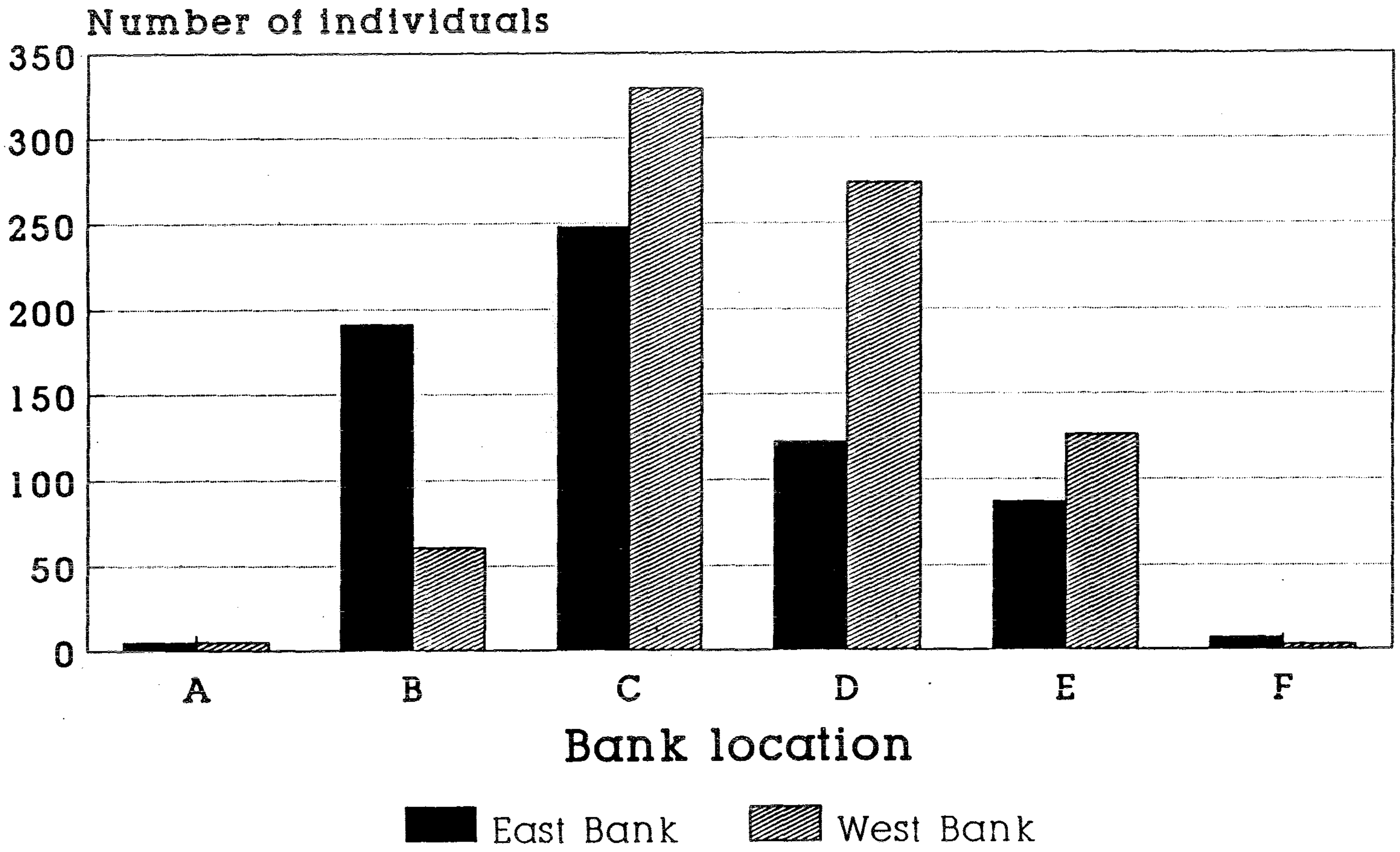


Figure V-C3. Frequency of Fremont Cottonwood by Bank Location

Source: Habitat Restoration Group

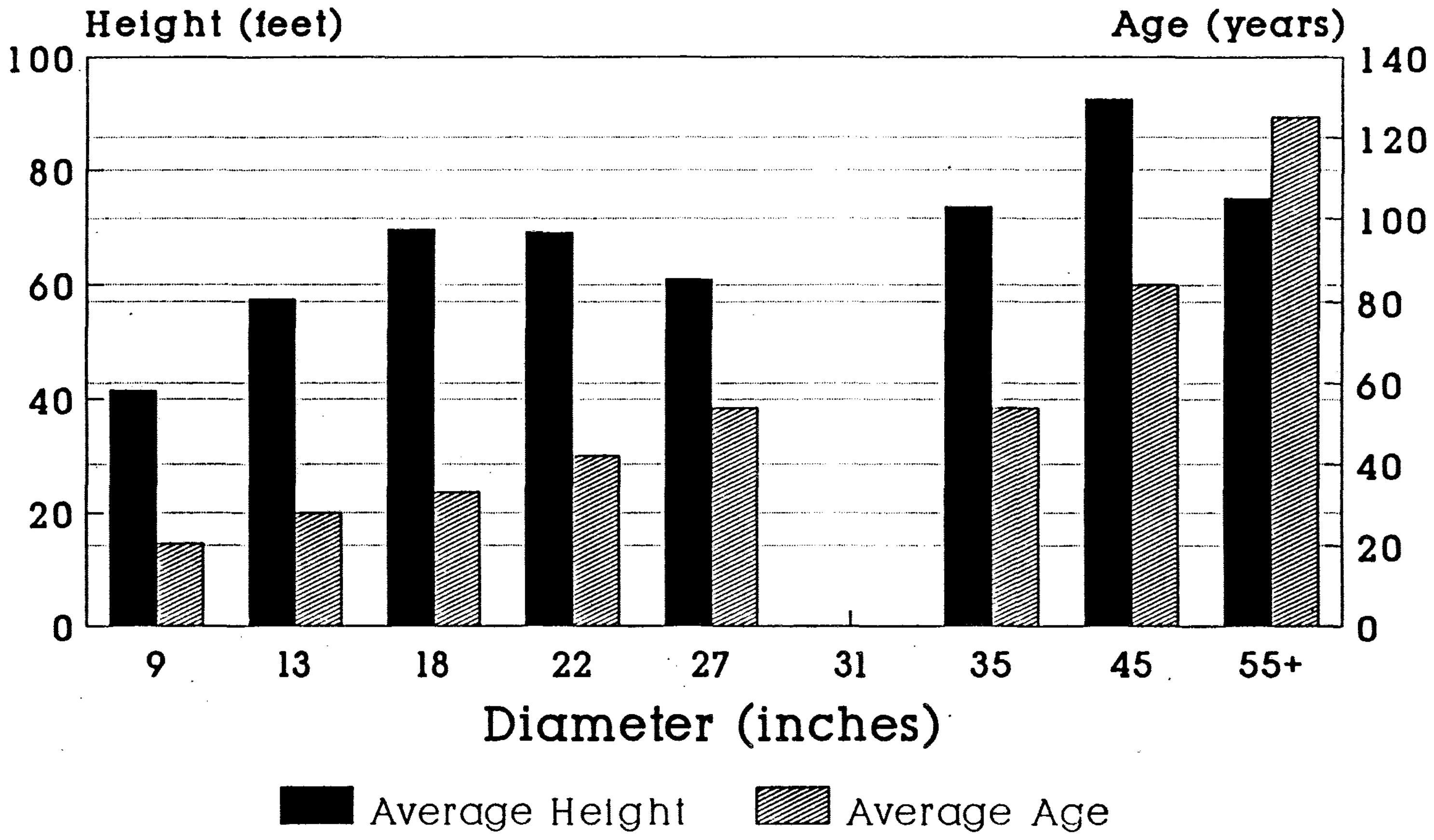


Figure V-C4. Size-Age Relationships in Fremont Cottonwood

Source: Habitat Restoration Group

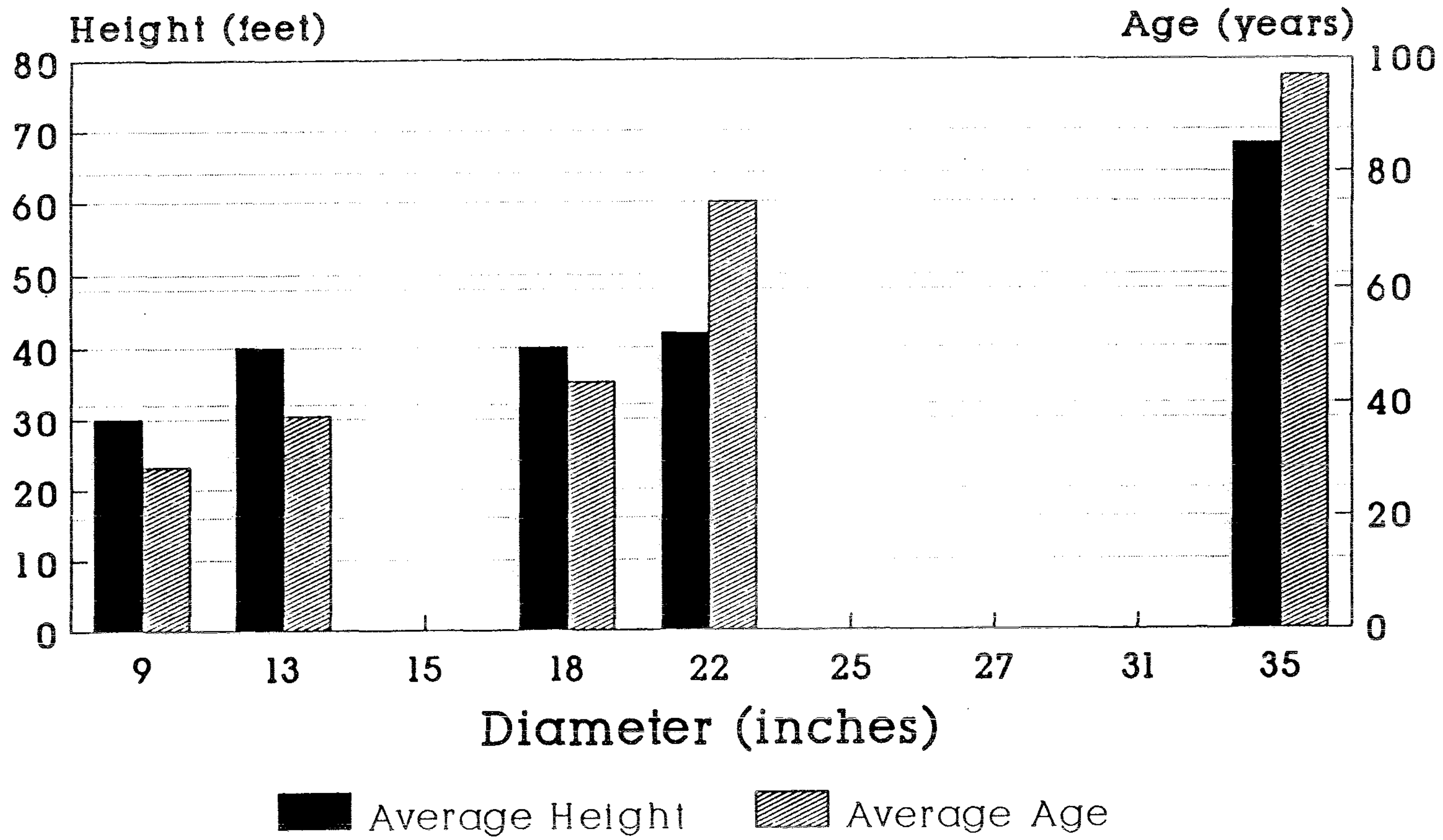


Figure V-C5. Size-Age Relationships in California Sycamore

Source: Habitat Restoration Group

APPENDIX W-A

GUADALUPE RIVER WILDLIFE MONITORING STUDY, JANUARY 1986 TO JANUARY 1987: SUMMARY OF METHODS AND RESULTS

W-A. Wildlife Monitoring

This appendix summarizes methods and results of the Guadalupe River wildlife monitoring study conducted from January 1986 to January 1987. It contains the following tables and figures:

Table WA-1	WHR Classifications for Size and Cover Classes for Valley Foothill Riparian Habitats
Table WA-2	Habitat Classification of Sample Plots
Table WA-3	Bird Species Observed in the Greatest Numbers
Table WA-4	Bird Species with Single Sightings
Table WA-5	Species Seen Only at the Percolation Ponds in Reach 12
Table WA-6	Mammals, Reptiles, and Amphibians Observed or Trapped during Guadalupe River Wildlife Monitoring Study
Figure WA-1	Wildlife Sampling Plots on the Guadalupe River
Figure WA-2	Data Sheet Used during Avian Censuses
Figures WA-3 and WA-4	Number of Birds Observed per Plot
Figure WA-5	Acreages of All Study Plots
Figure WA-6	Average Number of Birds Observed per Acre for Each Plot

Appendix W-A. Guadalupe River Wildlife Monitoring Study, January 1986 to January 1987: Summary of Methods and Results

SUMMARY

Note: This summary is based on preliminary, unpublished draft reports prepared by Harvey and Stanley Associates in 1987-88 and H.T. Harvey and Associates in 1989.

Wildlife use of the Guadalupe River from Interstate 280 to Blossom Hill Road was systematically monitored from January 21, 1986 to January 21, 1987. Monitoring was performed to provide baseline data on wildlife species occurrence and habitat use in the study area to aid in the evaluation of impacts of the proposed Flood Control Project. Effort was focused on sampling avian populations, with less intensive sampling of mammal, reptile and amphibian populations.

A cumulative total of 17,979 birds of 112 species were recorded during 1,045 censuses in 49 sample plots. The cumulative number of bird species recorded in each plot ranged from 17 to 44, with a mean of 30 species. Plots with high bird species richness had structurally complex, layered riparian habitat, and were adjacent to less disturbed land (e.g., orchards or quiet residential neighborhoods). Plots with low bird species richness were lacking at least one layer of riparian vegetation (e.g., canopy, mid-canopy, understory, ground cover), and were adjacent to one or more busy roads. The average density of individual birds per acre in the sample plots ranged from four to 77, with a mean of 34 per acre. Plots with high average bird densities were located in areas where the riparian corridor was broad with structurally complex, layered habitat. Plots with low bird densities were dominated by grass, shrubs or barren land, lacked canopy cover, or encompassed percolation ponds. The most abundant bird species were those which gather in flocks, and those which are commonly found in urban/suburban settings.

The mammal and herptile trapping yielded three species of mammals, one species of reptile, and one species of amphibian. An additional ten species of mammals, two reptiles and two amphibians were seen during the avian surveys. Overall, mammal and herptile diversity and abundance was very low, probably due to urban-related impacts to habitat quality.

Meyer (1988) compares the list of species recorded in this monitoring study to a predicted species list generated by the California Department of Fish and Game Wildlife Habitat Relationships Program (WHR).

Methods

Approach

Forty-nine census plots were established in the study area (Figure W-A1). Each plot was sampled twice monthly for one year, using modified fixed-radius point (Hutto et al. 1986)

Stratification by stream reach allowed for data collection in all major areas which might be affected by the proposed project, so that specific data would be available with which to evaluate impacts. Plots were established in every reach except Reach 8, due to limitations of access. Stratification by size and cover class provided information on use of various serial stages, which was used to aid evaluation of impacts, and aided in prediction of wildlife use of areas revegetated as mitigation. Stratified sampling also provided replicate sampling areas with similar dominant habitat structure, which was then used to assess the effects of secondary factors such as adjacent land use or understory vegetation.

Methods and results of the sampling are presented in detail below.

Habitat Classification. Habitats were classified according to the California Department of Fish and Game WHRP categories for wooded habitats (Salwasser and Laudenslayer 1982). Most of the sample plots were classified as Valley-Foothill Riparian (VFR), with additional sub-categories based on the diameter at breast height (DBH) and percent canopy closure. Table W-A1 lists the size and cover classes for VFR habitat which are possible in the WHR system.

The 49 sample plots were numbered with a prefix to indicate reach number, and a decimal suffix to indicate the relative placement of the plot within the study area. The reaches are numbered 6 to 12, and the plot names begin with 6.05 at the downstream (north) end of the study area, and end with 12.45 at the upstream (south) end of the study area. The locations of the sample plots are shown in Figure W-A1. Three of the plots in Reach 12 (Plots 12.42, 12.44, and 12.45) encompassed percolation ponds, two of which (12.42 and 12.44) are out-of-channel ponds, outside of the Guadalupe River corridor.

Avian Sampling Method. The locations of all 49 of the sample plots were selected for the avian census routine. The size of each plot was determined by the area which could be thoroughly sampled within 10 minutes (Scott 1981). In open, thinly vegetated areas, plots tended to be larger than in thickly wooded, complex areas. In some cases (e.g., plot 11.295, see Figure W-A1) the size of the sample plot was determined by the size of the vegetative element of interest.

Within each plot, and during each sample period, observations were recorded in 10 minute periods between dawn and 9:30 a.m. (Robbins 1981). Sampling cycles began with Plot 12.45 and proceeded north to Plot 6.05. Approximately 4 plots were sampled per day, which allowed for sampling of each plot about every 14 days, with varied daily starting times per sampling site.

Figure W-A2 shows the data sheet used in avian censuses. The date, time, plot number, weather (temperature in degrees Fahrenheit, wind speed, wind direction, cloud cover and sky condition), relative water level in the river, plant phenology, and condition of the sample site were recorded at the beginning of each sample period. All observations (visual and aural) of bird presence during the sample period were recorded. No area outside the stream corridor was included in any of the sample plots, except for plots which encompassed out-of-channel percolation ponds in Reach 12.

Plots were sampled by total area count. Each record (i.e., observation) included species observed, method of observation (seen or heard), numbers observed, activity of the individual or group, substrate, and location of the bird within the canopy. Every attempt was made to count each bird only once during a sample period, and in situations where there was doubt, the bird in question was not counted. Birds flying over the sample area were not counted, but birds flushed from the plot were recorded, as were birds flying along the length of the river (e.g., Belted Kingfisher).

Sampling was not performed during mornings with rain, wind speed greater than 8mph, nor low fog. Sampling continued for 12 months commencing 21 January 1986, and concluding 21 January 1987. Most plots were sampled 21 times, but a few were sampled 20 times, and one was sampled 16 times. The sampling omissions occurred when high waters and other obstacles made access to those sites impossible.

Mammal and Herptile Survey Method. Mammals, reptiles and amphibians were surveyed less exhaustively. Small mammal trapping was attempted in areas where sign or activity had been observed, or activity was suspected. A total of 560 trap nights were attempted in a variety of plots. Mammal activity and sign observed during the avian census periods were also recorded.

Herptiles were recorded by observation during the avian sampling program, by specific searches of suitable habitat, and by trapping using drift nets and funnel traps. Eight sample plots were selected for trapping efforts, and trapping continued for 16 trap-nights.

Results

Habitat Classification

Table W-A2 lists some of the physical characteristics of the sample plots which were established in the study area. Seventeen of the 24 possible WHR combinations of Valley-Foothill Riparian size and cover class are represented by the sampling locations. Eight plots were dominated by Fremont cottonwood, seven by western sycamore, and eight with mixed riparian tree species. The remaining 26 plots were dominated by a variety of other plant species. Twenty-eight of the plots (58%) were represented by DBH size classes 3 and 4. Dense canopy was found in 25 (51%) of the plots, while medium and sparse classifications each accounted for eight (16%) of the plots. The remaining five (10%) plots were classified as open or barren.

Avian Sampling

One hundred and twelve species of birds were recorded during the censuses over the entire sampling year, including domestic goose and an unidentified parrot, both exotic species which are not considered to be "established" introductions in Santa Clara County (i.e., they do not have self-sustaining populations in the wild). Appendix W-AA lists all the bird species observed during the censuses, the total cumulative number seen for each species, the number of plots in which each was seen, and the number of months in which each was seen. Ninety-nine species were seen in plots which contained riparian vegetation (90% of the species total), and 16 were only found in and around the percolation ponds (14%). Eight additional species were seen in the study area but not recorded during sampling periods. These eight include the Common Loon, American Wigeon, Turkey Vulture, Osprey, Black-shouldered Kite, Long-billed Curlew, Ash-throated Flycatcher, and Winter Wren. Of these, the loon, wigeon, Osprey and curlew were only seen at the out-of-channel percolation ponds adjacent to Reach 12.

A cumulative total of 17,979 birds were observed during 1,045 census periods. The ten species observed in the greatest numbers were (in order of decreasing abundance): House Finch, Bushtit, Mallard, White-crowned Sparrow, Anna's Hummingbird, California Towhee, Yellow-rumped Warbler, Song Sparrow, Black Phoebe, and Cedar Waxwing. Table W-A3 lists the number of individuals counted for each of these species. The House Finch, Bushtit, Mallard, White-crowned Sparrow, Yellow-rumped Warbler, and Cedar Waxwing are flocking species, or occur in this area during the portion of the year when they may be found in flocks.

Eleven species found during this study were represented by only a single sighting of a single bird during the entire year of sampling. These species are listed in Table W-A4.

No individual species was seen in all 49 of the sample plots, but Anna's Hummingbird, Black Phoebe, Bushtit, California Towhee, and House Finch were each recorded in 48 of the 49 plots. These birds are generally acknowledged as species which occur in disturbed habitats, such as those in the urban setting of the study area, as well as less disturbed habitats. Twenty-four species were seen in at least half of the 49 sample plots, while 25 species were only recorded in a single plot.

Thirty-two species were seen during at least 10 of the 12 months of the survey, and are considered permanent residents. Winter and summer residents (12 and 25 species, respectively) were present for up to six months of the year.

Sixteen species were seen only in the percolation ponds in Reach 12. These species, and the numbers of individuals seen of each are shown in Table W-A5.

Total Number of Observed Individuals Per Plot. The cumulative 17,979 individuals recorded during the study were not distributed evenly throughout the plots. Figure W-A3 shows the unadjusted total numbers observed in each plot. The numbers are not corrected for the number of samples taken in each sample plot nor for the area of the plot.

Plots 12.42, 12.41, 6.2, 12.40, 7.9, 10.23, 12.45, 9.14, 12.43, and 7.8 were, in decreasing order, the plots with the largest number of observations. The cumulative total number of individuals observed in these ten plots ranged from 1,247 to 493. Plot 12.42, with the largest number of observed individuals, is the largest of the percolation ponds north of Blossom Hill Road. Ninety-two percent of that plot's total number of individuals were waterbirds.

The sample plot with the fewest cumulative total individuals was Plot 7.35, which had only 67 observed individuals for the year. The number of observations was probably a function of the plot's small size, and was affected by construction of a bridge which began in early summer and continued throughout the rest of the sample year. The ten plots with the fewest observed individuals were, in decreasing order, 11.315, 9.17, 11.34, 10.25, 9.16, 10.27, 10.29, 11.34, 11.295, 11.32, 11.33, 10.28, and 7.35. The cumulative number of individuals observed in these plots ranged from 67 to 207.

Number of Bird Species Seen Per Plot. The cumulative number of species observed in each sample plot ranged from 17 (Plot 7.35) to 44 (Plot 12.41). Figure W-A4 shows the number of species seen in each sample area. The average number of species recorded in each plot was 30 (only 27% of the 112 species recorded during the entire study). The nine plots with the highest species counts were located in areas where the corridor was adjacent with agricultural land or fallow fields, and most also had a full compliment of vegetative layers (except Plot 12.43, which encompassed a percolation pond).

The fewest species were observed in Plot 7.35, which was severely altered (e.g., top soil and all vegetation removed) during the course of the study. The nine plots with the next lowest species richness were each lacking at least one layer of vegetation. Six of these plots were also situated in areas where heavily traveled roads border the river corridor on one or more sides.

Number of Individuals Recorded Per Acre. Acreage of each sample area is shown in Figure W-A5. Fifty-nine percent of the 49 sample sites were less than 0.5 acre. Three of the largest plots (12.42, 12.44 and 12.45) encompassed percolation ponds (9.9, 4.05, and 2.08 acres, respectively). The two plots dominated by shrubby vegetation (10.23 and 10.24) were also among the largest, measuring 2.0 and 4.5 acres, respectively. The largest plot with canopy cover was Plot 6.2, which measured 1.16 acres.

Figure WA-6 shows the average number of individuals recorded per acre (computed by dividing the average number of individuals seen per sample in each plot by the size of the plot). Average minimum densities per acre ranged from 4 individuals (Plot 12.44) to 77 individuals (Plot 6.3) (using pooled data for the entire sample year). The average number of individuals seen per acre was 34.2. The largest plots had relatively low densities of individuals, on average, while moderately-sized plots had the highest densities.

The plots with highest average number of birds per acre were all located in areas where the riparian corridor is broad and the vegetation is structurally complex. There were large riparian trees in or near these plots, and at least one layer of vegetation extended to one edge of the river corridor. Plot 6.3, which included two linear groups of cottonwoods, and was bordered by the (then) abandoned Guadalupe Freeway corridor on the west and a relatively quiet neighborhood on the east, had the highest average number of individuals per acre (77 birds).

The plots with the fewest individuals per acre encompassed areas which were either barren, or had grass and shrubs with only a few, small trees. The three percolation ponds (Plots 12.45, 12.44, and 12.42) had three of the four lowest average densities per acre. The lowest density (4 individuals per acre) was recorded at Plot 12.44. All of the ponds were surrounded by dirt and gravel levees.

Mammal and Herptile Sampling

Fourteen species of mammals were recorded (see Table W-A6). Surveys conducted for 560 trap-nights yielded only eight individuals of three species of mammals in the eight plots sampled. There were no recoveries in three of the sampled plots, and none of the individuals trapped in any of the plots were trapped in any subsequent trapping effort.

These numbers were surprisingly low, and led to a somewhat reduced level of effort in the trapping program. A typical grassland trapping program for small mammals may yield up one capture per two or three trap nights, instead of the one animal per 70 trap nights average recorded by this effort. Overall, the habitat in the study area is very poor for small mammals, with little undergrowth, extensive areas with compacted soil, limited areas of adjacent undeveloped land, vector control operations in and adjacent to the corridor, and predation and disturbance by dogs and cats. These factors are likely explanations of the low capture success.

Six species of reptiles, amphibians and unidentifiable tadpoles were observed during census periods and during trapping (Table W-A6). The only amphibian species commonly observed within the survey area was the Western Toad, which was seen in large numbers during the summer. The trapping effort yielded four Western Fence Lizards, and numerous young toads, but no snakes or salamanders. Two species of snake were observed during non-census periods, and are recorded in Table W-A6.

The same factors limiting mammal abundance, along with the presence of urban pollutants, are probably limiting herptile abundance, as well. Additionally, the river often dries prior to the breeding season, so suitable areas for reproduction are often limited, and there is little litter or ground cover along many sections of river.

Table WA-1. WHR Classifications for Size and Cover Classes for Valley Foothill Riparian Habitats

Size Classes		Cover Classes	
DBH	Field Name	Percent Cover	Field Name
<1"	1	0-10%	Barren (B)
1"-6"	2	10-24%	Sparse (O)
6"-11"	3	25-39%	Open (P)
11"-24"	4	40-59%	Medium (M)
>24"	5	60-100%	Dense (D)
>24" and understory	6		

Table WA-2. Habitat Classification of Sample Plots

Plot Number	Reach	Acreage	Size Class	Cover Class
6.05	6	0.58	3	M
6.1	6	0.31	6	D
6.2	6	0.73	3	M
6.3	6	0.30	3	S
7.35	7	0.227	2	S
7.4	7	0.4	4	D
7.5	7	0.37	3	D
7.6	7	0.66	4	D
7.7	7	0.49	4	D
7.8	7	0.56	4	D
7.9	7	0.45	5	D
7.10	7	0.43	3	D
7.11	7	0.31	3	D
7.12	7	0.32	4	M
9.13	9	0.73	4	D
9.14	9	0.49	6	D
9.15	9	0.50	4	D
9.16	9	0.42	4	M
9.17	9	0.36	4	D
10.18	10	0.29	3	D
10.19	10	0.31	4	D
10.20	10	0.34	2	D
10.21	10	0.35	3	O
10.22	10	0.65	3	O
10.23	10	4.50	0	S
10.24	10	2.00	0	S
10.25	10	0.59	3	M
10.26	10	0.53	3	D
10.27	10	0.21	5	D
10.28	10	0.21	3	D
10.29	10	0.32	2	S
11.295	11	0.16	5	D
11.30	11	0.26	4	D
11.31	11	0.39	4	D
11.315	11	0.35	2	M
11.32	11	0.68	2	O
11.33	11	0.40	1	S
11.34	11	0.71	6	D
11.35	11	0.81	3	D

Table WA-2. Habitat Classification of Sample Plots (Cont'd.)

Plot Number	Reach	Acreage	Size Class	Cover Class
11.36	11	0.42	4	D
11.37	11	0.43	4	M
12.38	12	0.60	0	S
12.39	12	0.26	5	O
12.40	12	1.16	4	O
12.41	12	1.01	5	S
12.42	12	9.9	0	B
12.43	12	2.08	1	M
12.44	12	4.05	0	B
12.45	12	2.18	0	B

Table WA-3. Bird Species Observed in the Greatest Numbers

Species	Number Recorded
House Finch	2310
Bushtit	1960
Mallard	1416
White-crowned Sparrow	1164
Anna's Hummingbird	796
Brown Towhee	774
Yellow-rumped Warbler	725
Song Sparrow	518
Black Phoebe	496
Cedar Waxwing	495

Table WA-4. Bird Species With Single Sightings

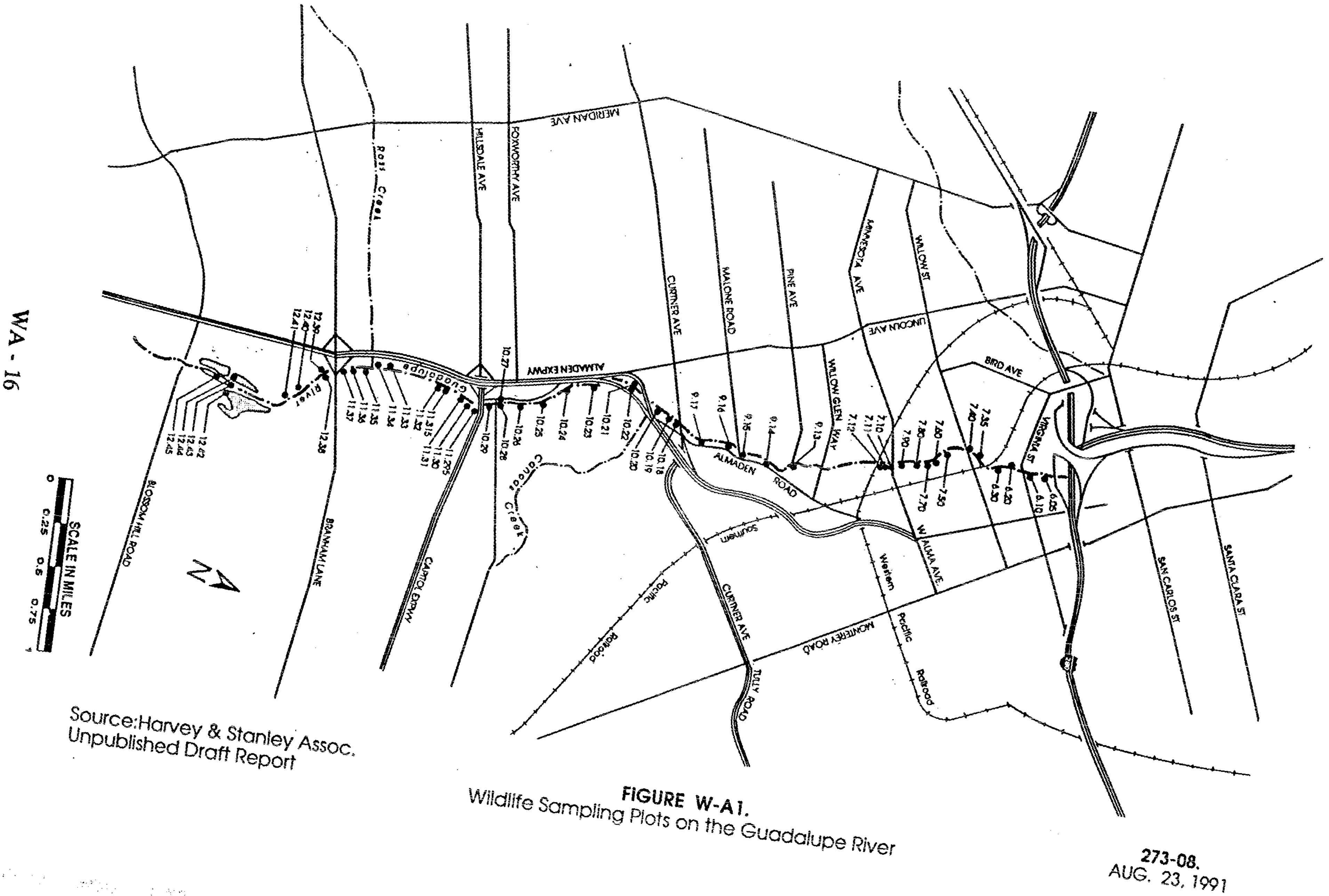
Horned Grebe
American Bittern
Merlin
Falcon species (Peregrine or Prairie)
Lesser Yellowlegs
Bonaparte's Gull
Barn Owl
Burrowing Owl
White-breasted Nuthatch
MacGillivray's Warbler
Western Meadowlark

Table WA-5. Species Seen Only at the Percolation Ponds in Reach 12

Common Name	Number Seen
Horned Grebe	1
Western Grebe	2
Double-crested Cormorant	135
American Bittern	1
Domestic Goose	2
Cinnamon Teal	5
Lesser Scaup	98
Common Goldeneye	2
Bufflehead	3
Ruddy Duck	40
Common Moorhen	12
Spotted Sandpiper	2
Common Snipe	4
Lesser Yellowlegs	1
California Gull	8
Herring Gull	7
TOTAL	322

Table WA-6. Mammals, Reptiles and Amphibians Observed or Trapped During Guadalupe River Wildlife Monitoring Study

Species	Trapped	Seen
Virginia Opossum	0	7
Broad-footed Mole	0	4
Black-tailed Hare	0	4
Cal. Ground Squirrel	0	11
Fox/Grey Squirrel	0	248
Pocket Gopher	0	81
Western Harvest Mouse	1	1
Muskrat	0	9
Norway Rat	5	0
House Mouse	2	0
Domestic Dog	0	74
Raccoon	0	15
Domestic Cat	0	52
Western Toad	19	392
Tadpoles (Spp. unknown)	0	200 +
Pacific Tree Frog	0	5
Bullfrog	0	19
Western Fence Lizard	4	7
Common Garter Snake	0	1
Ring-necked Snake	0	1
TOTAL	**31**	**1133**



Source:Harvey & Stanley Assoc.
Unpublished Draft Report

FIGURE W-A1.
Wildlife Sampling Plots on the Guadalupe River

273-08.
AUG. 23, 1991

GUADALUPE RIVER FLOOD CONTROL PROJECT
PLOT CENSUS

OBSERVER ______________ DATE ______________ PLOT ______________

SPECIES	S/H	NUMBER	ACTIVITY	SIGN	SUBSTRATE	LAYER	CANOPY	NOTES

NUMBER OF BIRD SPECIES ______________

TOTAL NUMBER OF BIRDS IN PLOT ______________

START ______________
TEMP. ______________
WIND SPEED ______________

FINISH ______________
SKY ______________
DIRECT ______________

PLANT PHENOL. ______________
WATER ______________

MAMMALS ______________
HERPS ______________
HUMAN ACTIVITY ______________
OTHER COMMENTS ______________
____

SOURCE: HARVEY & STANLEY ASSOC., UNPUBLISHED DRAFT REPORT

Figure W-A2
Data sheet used during avian censuses

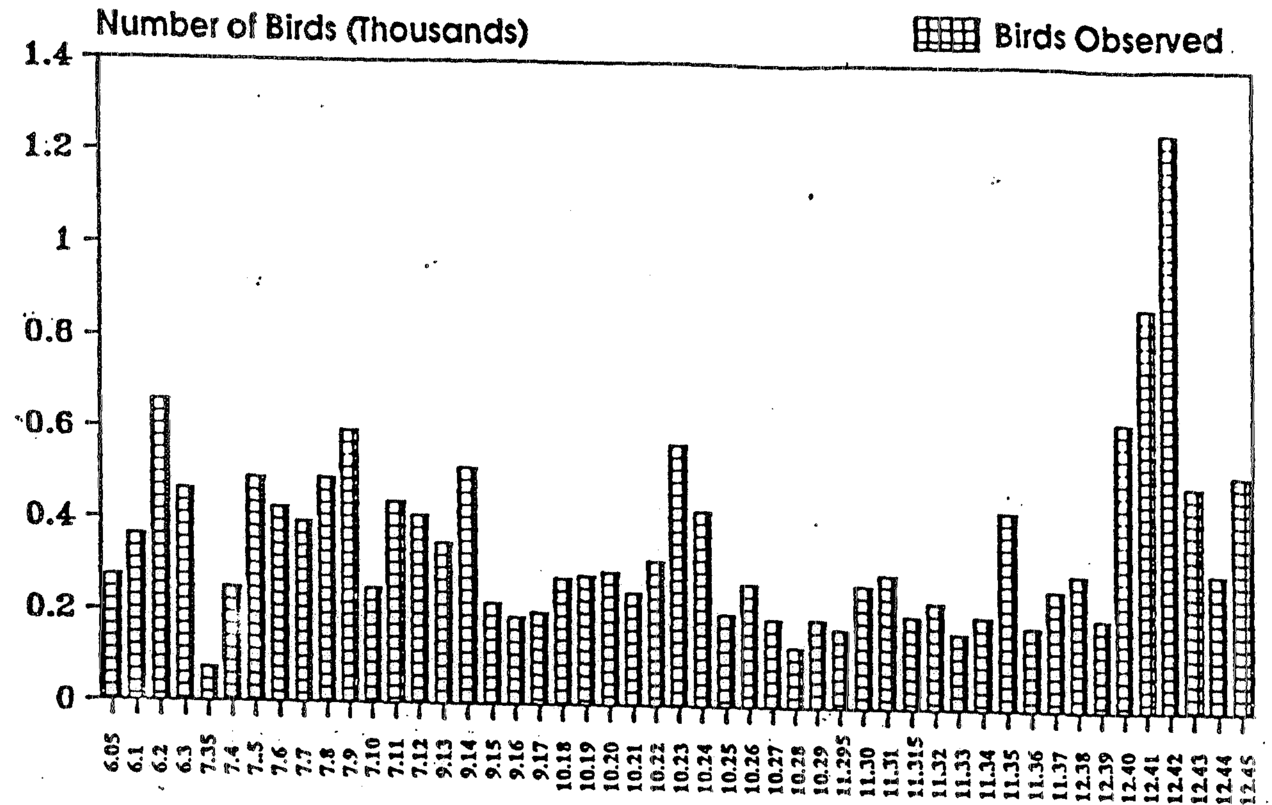


Figure W-A3. Number of Birds Observed Per Plot.

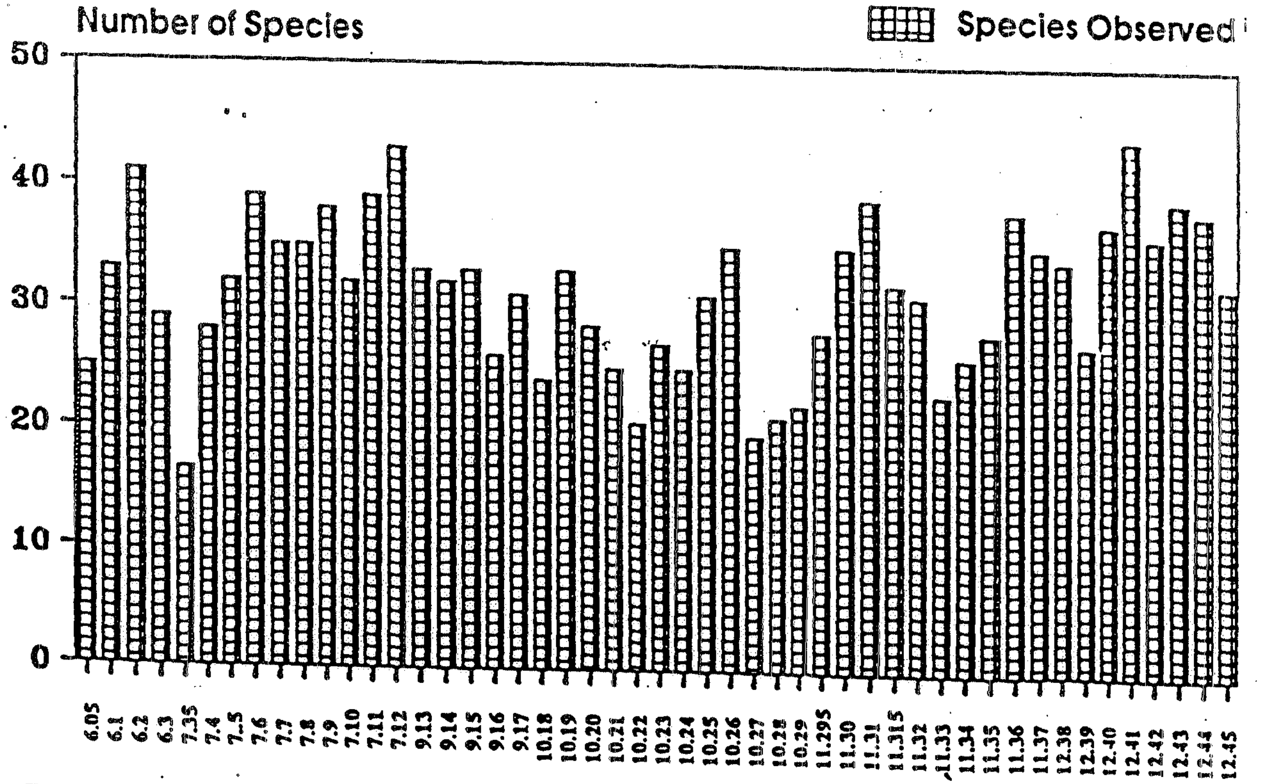


Figure W-A 4. Bird Species Observed Per Plot.

Source: Harvey & Stanley Assoc.,
Unpublished Draft Report

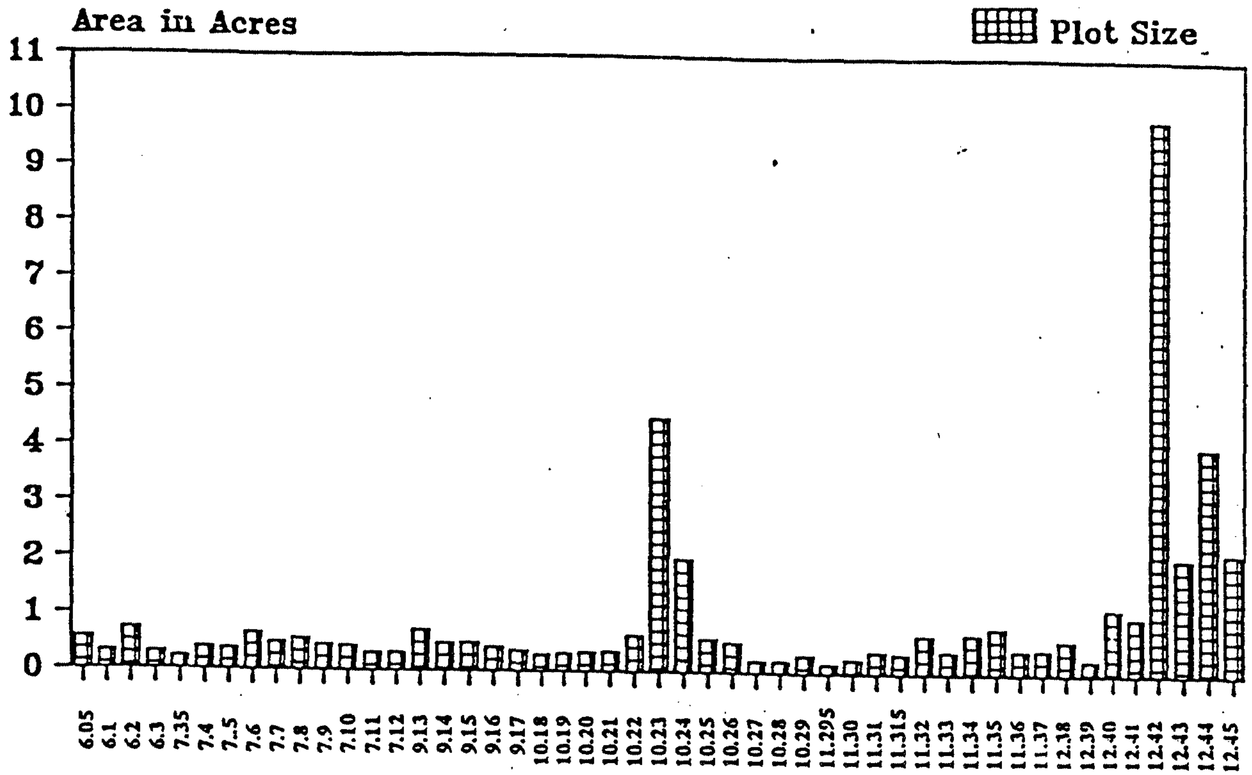


Figure W-A5. Acreages of All Study Plots.

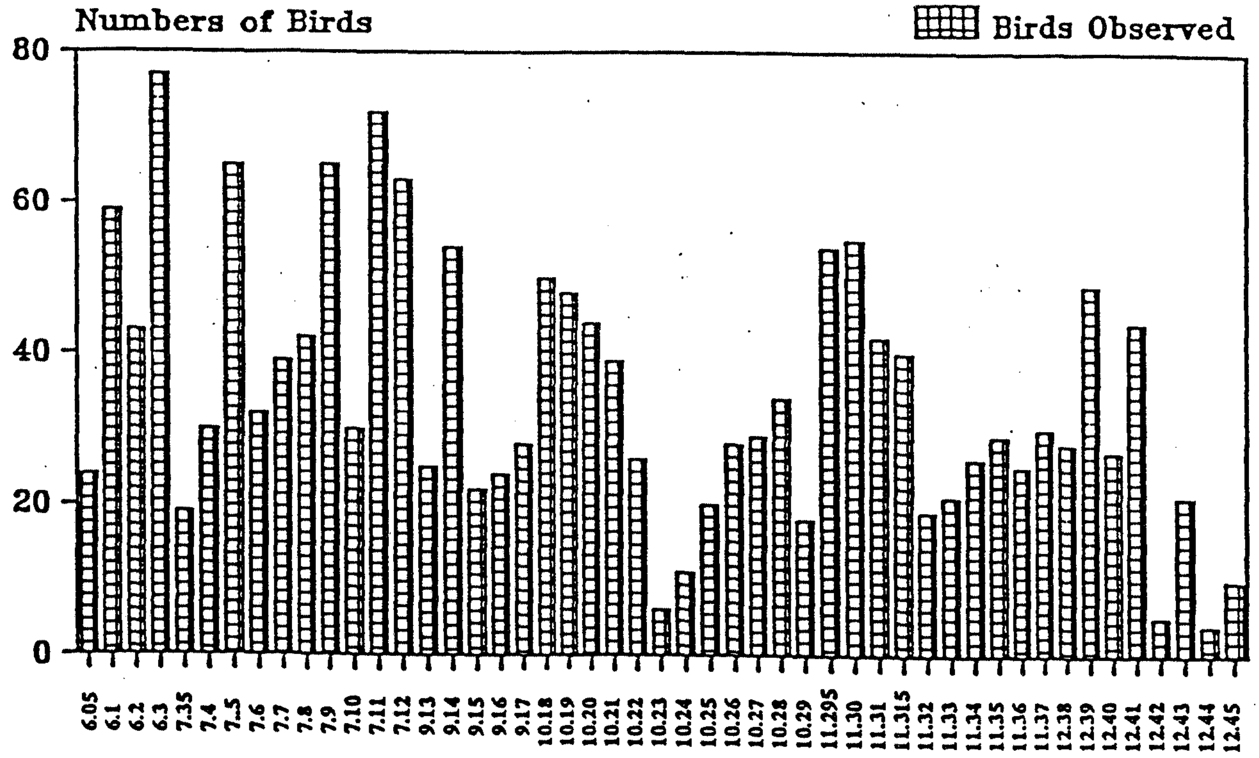


Figure W-A6. Average Number of Birds Observed Per Acre For Each Plot.

APPENDIX W-AA

BIRD SPECIES RECORDED DURING AVIAN CENSUSES, JANUARY 1986 TO JANUARY 1987; GUADALUPE RIVER, REACHES 6-12

W-AA. Bird Census

APPENDIX W-AA. Bird Species Recorded during Avian Censuses, January 1986 to January 1987; Guadalupe River, Reaches 6-7 and 9-12, San Jose, Santa Clara County.

KEY:

***:** Species was seen only or primarily at out-of-channel percolation ponds adjacent to Reach 12.

	Number of Individuals	Number of Plots	Number of Months
Pied-billed Grebe	44 *	7	12
Horned Grebe	1 *	1	1
Western Grebe	2 *	1	1
Double-Crested Cormorant	135 *	7	6
American Bittern	1	1	1
Great Blue Heron	15	10	11
Great Egret	44	24	12
Snowy Egret	59	19	12
Green-backed Heron	34	12	9
Black-crowned Night-Heron	73	10	9
Domestic Goose	2	1	2
Mallard	1416	34	12
Cinnamon Teal	5 *	1	1
Lesser Scaup	98 *	1	5
Common Goldeneye	2 *	1	2
Bufflehead	3 *	1	1
Ruddy Duck	40 *	1	3
Sharp-skinned Hawk	2	2	2
Cooper's Hawk	2	2	3
Red-shouldered Hawk	25	7	8
Red-tailed Hawk	26	12	11
American Kestrel	35	15	12
Merlin	1	1	1

	Number of Individuals		Number of Plots	Number of Months
Unidentified Falcon (Peregrine/Prairie)	1	*	1	1
California Quail	178		12	12
Common Moorhen	12	*	2	4
American Coot	185	*	8	9
Killdeer	77		10	12
Spotted Sandpiper	2	*	1	2
Common Snipe	4	*	2	2
Lesser Yellowlegs	1		1	0
Bonaparte's Gull	1	*	1	1
Ring-billed Gull	209	*	17	10
California Gull	8	*	3	4
Herring Gull	7	*	2	3
Gull Species (unidentified)	121		N/A	N/A
Caspian Tern	17	*	9	5
Forster's Tern	136	*	14	4
Rock Dove	77		14	10
Band-tailed Pigeon	4		2	1
Mourning Dove	491		44	12
Parrot (unidentified escape)	2		2	12
Barn Owl	1		1	1
Burrowing Owl	1		1	1
White-throated Swift	23		11	3
Black-chinned Hummingbird	6		5	3
Anna's Hummingbird	796		48	12
Rufous Hummingbird	2		2	1
Allen's Hummingbird	6		3	1
Hummingbird Species	50		N/A	N/A
Belted Kingfisher	298		46	12

	Number of Individuals	Number of Plots	Number of Months
Acorn Woodpecker	24	6	7
Nutall's Woodpecker	27	17	12
Downy Woodpecker	54	21	12
Hairy Woodpecker	3	2	2
Red-breasted Sapsucker	9	7	4
Northern Flicker	64	29	7
Woodpecker Species	9	N/A	N/A
Willow Flycatcher	19	13	5
Pacific-slope Flycatcher	57	24	7
Black Phoebe	496	48	12
Flycatcher Species	2	N/A	N/A
Violet-green Swallow	6	1	1
Northern Rough-Winged Swallow	412	41	6
Cliff Swallow	200	23	4
Barn Swallow	22	7	3
Swallow Species	9	N/A	N/A
Scrub Jay	145	34	12
American Crow	58	18	10
Chestnut-backed Chickadee	151	27	12
Plain Titmouse	50	13	11
Bushtit	1960	48	12
White-breasted Nuthatch	1	1	1
Brown Creeper	5	3	2
Bewick Wren	155	30	12
House Wren	4	3	3
Wren Species	1	N/A	N/A
Ruby-crowned Kinglet	63	25	7
Swainson's Thrush	2	2	2

	Number of Individuals	Number of Plots	Number of Months
Hermit Thrush	16	11	8
American Robin	414	36	9
Varied Thrush	2	2	1
Thrush Species	1	N/A	N/A
Northern Mockingbird	206	40	11
American Pipit	45	3	6
Cedar Waxwing	495	20	8
Loggerhead Shrike	6	2	5
European Starling	428	30	12
Hutton's Vireo	4	4	2
Warbling Vireo	45	16	4
Orange-crowned Warbler	14	9	6
Yellow Warbler	75	25	8
Yellow-rumped Warbler	725	43	9
MacGillivray's Warbler	1	1	1
Common Yellowthroat	8	4	5
Wilson's Warbler	54	22	7
Warbler Species	6	N/A	N/A
Western Tanager	15	10	2
Black-headed Grosbeak	47	19	4
Lazuli Bunting	2	1	2
Rufous-sided Towhee	5	4	6
California Towhee	774	48	11
Fox Sparrow	7	5	3
Song Sparrow	518	47	12
Lincoln's Sparrow	10	8	5
Golden-crowned Sparrow	100	17	6
White-crowned Sparrow	1164	42	8

	Number of Individuals	Number of Plots	Number of Months
Sparrow Species	14	N/A	N/A
Dark-eyed Junco	75	7	10
Red-winged Blackbird	63	7	8
Western Meadowlark	1	1	2
Brewer's Blackbird	292	23	10
Brown-headed Cowbird	84	9	5
Hooded Oriole	18	9	4
Northern Oriole	142	25	6
Purple Finch	7	4	3
House Finch	2310	48	12
Pine Siskin	6	1	1
Lesser Goldfinch	322	28	11
American Goldfinch	381	25	2
House Sparrow	88	14	10

APPENDIX W-B

WILDLIFE SPECIES OBSERVED OR PREDICTED TO OCCUR IN THE GUADALUPE RIVER PROJECT AREA (REACHES 6-12, A, AND GUADALUPE CREEK, ROSS CREEK, AND CANOAS CREEK)

Appendix W-B. Species Observed or Predicted to Occur in the Guadalupe River Project Area

Appendix W-B. Wildlife Species Observed or Predicted to Occur in the Guadalupe River Project Area (Reaches A, 6-12, Guadalupe Creek, Ross Creek, and Canoas Creek), San Jose, Santa Clara County

KEY:

O: Species observed in the indicated reach of the study area.
S: Sign of species (e.g., tracks) observed in the indicated reach of the study area.
P: Species predicted to occur in the indicated reach of the study area.
P?: Species potentially occurs in the indicated reach of the study area (the available information is insufficient to predict this species occurrence or to eliminate it as a possibility).

n: Bird species known or expected to nest in or immediately adjacent to the indicated reach of the study area.
a: Species expected to be primarily or entirely aerial in the reach indicated, having little interaction with terrestrial habitats.

Notes:

1) The area considered in preparation of this list did not include the out-of-channel percolation ponds adjacent to Reach 12 or Guadalupe Creek.
2) The "Urban Forest" column refers to lands directly affected by the project in Reaches 6, 7 and 8.
3) Refer to Appendix W-C for information on the seasonal status of bird species in each reach.

	REACH											
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	Urban Forest Rchs 6-8
CLASS: AMPHIBIA												
ORDER: CAUDATA (Salamanders)												
FAMILY: PLETHODONITDAE (Lungless Salamanders)												
California Slender Salamander (*Batrachoseps attenuatus*)	P	P	P	P	P	P	P	P	P	P	P	P
ORDER: SALIENTIA (Frogs and Toads)												
FAMILY: BUFONIDAE (True Toads)												
Western Toad (*Bufo boreas*)	O	O	O	P	P	O	O	O	P	O	P	P
FAMILY: HYLIDAE (Treefrogs and Relatives)												
Pacific Treefrog (*Hyla regilla*)	O	O	O	O	O	O	O	O	O	O	O	P

	REACH											Urban Forest
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	Rchs 6-8
FAMILY: RANIDAE (True Frogs)												
Bullfrog (*Rana catesbeiana*)	P	O	O	P	P	O	O	O	P	P	P	-
CLASS: REPTILIA												
ORDER: TESTUDINESS (Turtles)												
FAMILY: EMYDIDAE (Pond and Marsh Turtles)												
Western Pond Turtle (*Clemmys marmorata*)	-	P?	P?	P?	P?	P?	P?	P?	-	-	-	-
ORDER: SQUAMATA (Lizards and Snakes)												
SUBORDER: SAURIA (Lizards)												
FAMILY: IGUANIDAE (Iguanids)												
Western Fence Lizard (*Sceloporus occidentalis*)	O	O	O	O	O	O	O	O	O	O	O	O
FAMILY: SCINCIDAE (Skinks)												
Western Skink (*Eumeces skiltonianus*)	-	P?	P?	P?	P?	P?	P?	-	P?	-	-	-
FAMILY: ANGUIDAE (Alligator Lizards and Relatives)												
Southern Alligator Lizard (*Gerrhonotus multicarinatus*)	P	P	P	P	P	P	P	P	P	P?	P	-
SUBORDER: SERPENTES (Snakes)												
FAMILY: COLUBRIDAE (Colubrids)												
Ringneck Snake (*Diadophis punctatus*)	-	P?	P?	P?	O	-	P?	P?	P	-	-	-
Racer (*Coluber constrictor*)	P?	P?	P?	P?	P?	P?	P?	P?	P	-	-	-
Gopher Snake (*Pituophis melanoleucus*)	P	P	P	P	P	O	P	O	P	P	P	P
Common Garter Snake (*Thamnophis sirtalis*)[1]	P	P	P	P	P	P	P	P	P	-	-	-

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[1] This species was observed during the year-long wildlife monitoring study (Appendix A), but the reach-specific location is not available.

	REACH											
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	Urban Forest Rchs 6-8
Western Terrestrial Garter Snake (*Thamnophis elegens*)	P?	P?	P?	P?	P?	P?	P?	P?	P	-	-	-
Western Aquatic Garter Snake (*Thamnophis couchi*)	P?	P?	P?	P?	P?	P?	P?	P?	P?	-	-	-
CLASS: AVES												
ORDER: PODICIPEDIFORMES (Grebes)												
FAMILY: PODICIPEDIDAE (Grebes)												
Pied-billed Grebe (*Podilymbus podiceps*)	-	-	-	-	-	-	-	P	-	-	-	-
ORDER: PELECANIFORMES (Tropicbirds, Pelicans, and Relatives)												
FAMILY: PHALACROCORACIDAE (Cormorants)												
Double-crested Cormorant (*Phalacrocorax auritus*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	O,a	O,a	-	-	-
ORDER: CICONIIFORMES (Herons, Storks, Ibises, and Relatives)												
FAMILY: ARDEIDAE (Herons and Bitterns)												
American Bittern (*Botaurus lentiginosus*)	-	-	-	-	-	-	-	P?	-	-	-	-
Great Blue Heron (*Ardea herodias*)	O	O	O	O	O	O	O	O	P	P	P	-
Great Egret (*Casmerodius albus*)	O	O	O	O	O	O	O	O	P	P	O	-
Snowy Egret (*Egretta thula*)	O	O	O	O	O	O	O	O	O	O	O	-
Green-backed Heron (*Butorides striatus*)	O	O,n?	O,n?	O,n?	O,n?	P	O	O	P	O	O	-
Black-crowned Night Heron (*Nycticorax nycticorax*)	O	O	P	P	O	P	P	O	P	P	P	-
ORDER: ANSERIFORMES (Screamers, Ducks, and Relatives)												
FAMILY: ANATIDAE (Swans, Geese, and Ducks)												
Canada Goose (*Branta canadensis*)	-	-	-	-	-	-	-	P,a	-	-	-	-

	REACH											Urban Forest
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	Rchs 6-8
Wood Duck (*Aix sponsa*)	-	P?	P?	P?	P?	-	P?	-	P?	-	-	-
Green-winged Teal (*Anas crecca*)	-	-	-	-	-	-	-	P?	-	-	-	-
Mallard (*Anas platyrhynchos*)	O,n	O,n	O,n	O,n	O,n	O	O,n?	O,n	O,n	O	O	P,a
Northern Pintail (*Anas acuta*)	-	-	-	-	-	-	-	P?	-	-	-	-
Cinnamon Teal (*Anas cyanoptera*)	P	-	-	-	-	-	-	P	P	-	-	-
Northern Shoveler (*Anas clypeata*)	-	-	-	-	-	-	-	P?	-	-	-	-
Gadwall (*Anas strepera*)	P	-	-	-	-	-	-	P	-	-	-	-
ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)												
FAMILY: CATHARTIDAE (American Vultures)												
Turkey Vulture (*Cathartes aura*)	O,a	O,a	O,a	P,a	P,a	O,a	O,a	O,a	O,a	P,a	O,a	O,a
FAMILY: ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)												
Osprey (*Pandion haliaetus*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
Black-shouldered Kite (*Elanus caeruleus*)	P?	-	O	-	-	O	-	-	-	-	-	-
Sharp-shinned Hawk (*Accipiter striatus*)	O	O	O	O	O	P	O	O	O	P	P	P
Cooper's Hawk (*Accipiter cooperii*)	O	O	P	P	O	O	P	P	O	P	O	O
Red-shouldered Hawk (*Buteo lineatus*)	O,n?	O,n?	O,n?	O,n?	O,n	P	O,n?	O	P	-	P	P
Red-tailed Hawk (*Buteo jamaicensis*)	O,n?	O,n?	O,n?	P,n?	P,n?	O	O,n?	O	O	P	O	P
FAMILY: FALCONIDAE (Caracaras and Falcons)												
American Kestrel (*Falco sparverius*)	O,n?	O,n?	O,n?	O,n?	O,n?	O	O,n?	O	O,n?	P	O,n?	O,n?
Merlin (*Falco columbarius*)	O	P	P	P	P	O	P	O	P	P	P	P
Peregrine Falcon (*Falco peregrinus*)	P?	-	-	-	-	-	-	P?	-	-	-	-
ORDER: GALLIFORMES (Megapodes, Currassows, Pheasants, and Relatives)												
FAMILY: PHASIANIDAE (Quails, Pheasants, and Relatives)												
California Quail (*Callipepla californica*)	O	P?	P?	P?	O,n	O,n	O,n	O,n	O,n	-	P?	-

	REACH											Urban Forest Rchs
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	6-8
ORDER: GRUIFORMES (Cranes, Rails, and Relatives)												
FAMILY: RALLIDAE (Rails, Gallinules, and Coots)												
Virginia Rail (*Rallus limicola*)	P?	-	-	-	-	-	-	P?	-	-	-	-
Common Moorhen (*Gallinula chloropus*)	O	-	-	-	-	-	-	P	-	-	-	-
American Coot (*Fulica americana*)	O	-	-	-	-	-	O	P	P	-	-	-
ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and Relatives)												
FAMILY: CHARADRIIDAE (Plovers and Relatives)												
Killdeer (*Charadrius vociferus*)	O,n	O	O,n	P	P	O,n	O,n?	O,n	O,n	O,n?	O,n	P
FAMILY: SCOLOPACIDAE (Sandpipers and Relatives)												
Greater Yellowlegs (*Tringa melanoleuca*)	O	P	P	P	P	P	P	O	O	P	P	-
Lesser Yellowlegs (*Tringa flavipes*)	P	-	-	-	-	-	-	P	-	-	-	-
Spotted Sandpiper (*Actitis macularia*)	P	P	P	P	P	P	P	O	O	P	P	-
Least Sandpiper (*Calidris minutilla*)	P	-	-	-	-	-	-	P	P	-	-	-
Baird's Sandpiper (*Calidris bairdii*)	-	-	-	-	-	-	-	P?	-	-	-	-
Pectoral Sandpiper (*Calidris melanotos*)	-	-	-	-	-	-	-	P?	-	-	-	-
Long-billed Dowitcher (*Limnodromus scolopaceus*)	P	-	-	-	-	-	-	P	P	-	-	-
Common Snipe (*Gallinago gallinago*)	O	P	P	P	P	O	P	O	O	O	O	-
FAMILY: LARIDAE (Gulls and Terns)												
Bonaparte's Gull (*Larus philadelphia*)	-	-	-	-	-	-	-	P,a	-	-	-	-
Mew Gull (*Larus canus*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	O,a	P,a	P,a	P,a	P,a
Ring-billed Gull (*Larus delawarensis*)	O,a	P,a	P,a	P,a	O,a	O,a	P,a	O,a	O,a	P,a	P,a	O,a
California Gull (*Larus californicus*)	O,a	O,a	O,a	O,a	O,a	O,a	O,a	O,a	O,a	O,a	O,a	O,a
Herring Gull (*Larus argentatus*)	O,a	P,a	P,a	P,a	P,a	P,a	P,a	O,a	O,a	P,a	P,a	P,a
Thayer's Gull (*Larus thayeri*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	O,a	P,a	P,a	P,a	P,a
Western Gull (*Larus occidentalis*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	-	P,a
Glaucous-winged Gull (*Larus glaucescens*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	-	P,a

	REACH											Urban Forest Rchs
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	6-8
Caspian Tern (*Sterna caspia*)	P,a	O,a	O,a	P,a	P,a	P,a	P,a	O	P,a	-	-	-
Forster's Tern (*Sterna forsteri*)	P	O,a	O,a	P,a	O,a	O,a	P,a	O	O	-	-	-
ORDER: COLUMBIFORMES (Pigeons and Doves)												
FAMILY: COLUMBIDAE (Pigeons and Doves)												
Rock Dove (*Columba livia*)	O,n	O,n	O	O	O,n	O,n	O,n	O,n	O	O,n	O	O,n
Band-tailed Pigeon (*Columba fasciata*)	P?	O	O	O	O	O	O	O	O	P?	P?	O
Mourning Dove (*Zenaida macroura*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
ORDER: STRIGIFORMES (Owls)												
FAMILY: TYTONIDAE (Barn Owls)												
Barn Owl (*Tyto alba*)	P	P,n?	P,n?	P,n?	O,n?	O,n?	P,n?	P	P	P	P	P,n?
FAMILY: STRIGIDAE (Typical Owls)												
Great Horned Owl (*Bubo virginianus*)	P?	P?	P?	P?	P?	P?	P?	P?	P,n?	P?	P?	P?
Burrowing Owl (*Athene cunicularia*)	O,n?	-	-	-	-	-	-	P,n?	-	-	-	-
ORDER: APODIFORMES (Swifts and Hummingbirds)												
FAMILY: APODIDAE (Swifts)												
Black Swift (*Cypseloides niger*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
Vaux's Swift (*Chaetura vauxi*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
White-throated Swift (*Aeronautes saxatalis*)	P,a	P,a	P,a	P,a	P,a	P,a	O,a	O,a	P,a	P,a	P,a	P,a
FAMILY: TROCHILIDAE (Hummingbirds)												
Black-chinned Hummingbird (*Archilochus alexandri*)	P	P	P	P	P	P	P	P	P	-	-	-
Anna's Hummingbird (*Calypte anna*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
Rufous Hummingbird (*Selasphorus rufus*)	P	O	P	P	O	P	P	P	P	P	P	P
Allen's Hummingbird (*Selasphorus sasin*)	P	O,n?	O,n?	P,n?	P,n?	P	P,n?	P	P,n?	P	P	P

	REACH											
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	Urban Forest Rchs 6-8
ORDER: CORACIIFORMES (Kingfishers and Relatives)												
FAMILY: ALCEDINIDAE (Kingfishers)												
Belted Kingfisher (*Ceryle alcyon*)	O	O,n?	O,n	O,n	O,n	O	O	O	O	O	O	-
ORDER: PICIFORMES (Woodpeckers and Relatives)												
FAMILY: PICIDAE (Woodpeckers and Wrynecks)												
Acorn Woodpecker (*Melanerpes formicivorous*)	-	-	-	-	-	O,n?	O,n	-	P	-	-	-
Red-breasted Sapsucker (*Sphyrapicus ruber*)	P	O	S	S	O	P	O	P	S	P?	P?	P
Red-naped Sapsucker (*Sphyrapicus nuchalis*)	-	P?	P?	P?	P?	-	P?	-	P?	-	-	P?
Nuttall's Woodpecker (*Picoides nuttallii*)	-	O,n?	O,n?	O,n?	O,n?	O,n	O,n	P,n?	O,n	-	-	P,n?
Downy Woodpecker (*Picoides pubescens*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	-	-	P
Hairy Woodpecker (*Picoides villosus*)	-	P	P	P	P	P	O	P	P	-	-	P
Northern Flicker (*Colaptes auratus*)	O	O	O	O	O	O	O	O	O,n?	O	O	O
ORDER: PASSERIFORMES (Perching Birds)												
FAMILY: TYRANNIDAE (Tyrant Flycatchers)												
Western Wood-Pewee (*Contopus sordidulus*)	P	P	P	P	P	P	P	P	P	-	-	P
Willow Flycatcher (*Empidonax traillii*)	P	P	P	P	P	P	P	P	P	-	-	-
Pacific-slope Flycatcher (*Empidonax difficilis*)	P	O,n	O,n	O,n	O,n	O	O,n?	O	O,n	P	P	P
Black Phoebe (*Sayornis nigricans*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n?
Say's Phoebe (*Sayornis saya*)	P	-	-	-	-	P	-	O	O	-	P	-
Ash-throated Flycatcher (*Myiarchus cinerascens*)	P?	P?	P?	P?	P?	P?	O	P?	P?	-	-	-
Western Kingbird (*Tyrannus verticalis*)	P	-	-	-	-	P?	-	P?	P	-	-	-
FAMILY: HIRUNDINIDAE (Swallows)												
Tree Swallow (*Tachycineta bicolor*)	P	P	O	P	P	P	P	P	P	P	P	P,a
Violet-green Swallow (*Tachycineta thalassina*)	P	O,n?	O,n?	O,n?	O,n?	O	O,n?	O	O,n?	P	P	P,a
Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)	P,n?	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	P	P	P,a
Cliff Swallow (*Hirundo pyrrhonota*)	P,n	O,n	P,n	O,n	P,n	O,n	O,n	O,n	O,n	P,n	P,n	O,n?

	REACH											Urban Forest Rchs 6-8
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	
Barn Swallow (*Hirundo rustica*)	O,n	O	O	O	O,n?	O,n	O	O,n	O	P	P	O,n
FAMILY: CORVIDAE (Jays, Magpies, and Crows)												
Scrub Jay (*Aphelocoma coerulescens*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
American Crow (*Corvus brachyrhynchos*)	P,n?	O,n?	O,n?	P,n?	O,n?	P	P,n?	O	O,n?	O	O,n?	O,n
FAMILY: PARIDAE (Titmice)												
Chestnut-backed Chickadee (*Parus rufescens*)	P,n?	O,n	O,n	O,n	O,n	O,n	O,n	P	O,n	-	P	P,n?
Plain Titmouse (*Parus inornatus*)	-	-	-	-	-	-	O,n	P?	O,n	-	-	P,n?
FAMILY: AEGITHALIDAE (Bushtit)												
Bushtit (*Psaltriparus minimus*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
FAMILY: SITTIDAE (Nuthatches)												
Red-breasted Nuthatch (Sitta canadensis)	-	P	P	P	P	P	P	-	P	-	-	P
White-breasted Nuthatch (*Sitta carolinensis*)	-	-	O	P	P	P	P	-	O,n?	-	-	P,n?
FAMILY: CERTHIIDAE (Creepers)												
Brown Creeper (*Certhia americana*)	P	P	P	P	O	P	O	-	P	-	-	P?
FAMILY: TROGLODYTIDAE (Wrens)												
Bewick's Wren (*Thryomanes bewickii*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	-	O,n	P,n
House Wren (*Troglodytes aedon*)	P	P	P	P	P	P	O	O	P	-	-	-
Winter Wren (*Troglodytes troglodytes*)	P	P	P	P	P	-	P	-	P	-	-	-
Marsh Wren (*Cistothorus palustris*)	P	-	-	-	-	-	-	P	-	-	-	-
FAMILY: MUSCICAPIDAE (Old World Warblers, Gnatcatchers, Kinglets, Thrushes, Bluebirds, and Wrentit)												
Golden-crowned Kinglet (*Regulus satrapa*)	P	P	P	P	P	P	P	P	P	-	-	P
Ruby-crowned Kinglet (*Regulus calendula*)	O	O	O	O	O	O	O	O	O	O	O	O
Blue-gray Gnatcatcher (*Polioptila caerulea*)	P	P	P	P	P	P	P	P	P	-	-	-
Swainson's Thrush (*Catharus ustulatus*)	P	P,n?	O,n?	P,n?	P,n?	P	P	P	P	-	-	-
Hermit Thrush (*Catharus guttatus*)	O	O	O	O	O	O	O	O	O	O	O	O
American Robin (*Turdus migratorius*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
Varied Thrush (*Ixoreus naevius*)	P?	P	P	P	O	P?	O	P?	P	-	-	P?
Wrentit (*Chamaea fasciata*)	-	P?	P?	P?	P?	P?	O,n	-	P,n	-	-	-

	REACH											Urban Forest
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	Rchs 6-8
FAMILY: MIMIDAE (Mockingbirds and Thrashers)												
Northern Mockingbird (*Mimus polyglottos*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
FAMILY: MOTACILLIDAE (Wagtails and Pipits)												
American Pipit (*Anthus rubescens*)	O	-	-	-	-	P	-	O	P	O	P	-
FAMILY: BOMBYCILLIDAE (Waxwings)												
Cedar Waxwing (*Bombycilla cedrorum*)	O	O	O	O	O	O	O	O	O	O	O	O
FAMILY: LANIIDAE (Shrikes)												
Loggerhead Shrike (*Lanius ludovicianus*)	O,n?	-	-	-	-	P	-	O,n?	O,n?	-	P	-
FAMILY: STURNIDAE (Starlings)												
European Starling (*Sturnus vulgaris*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
FAMILY: VIREONIDAE (Typical Vireos)												
Solitary Vireo (*Vireo solitarius*)	P	P	P	P	P	P	P	P	P	-	-	P
Hutton's Vireo (*Vireo huttoni*)	-	P	P	P	P	P?	O,n	P?	P	-	-	P?
Warbling Vireo (*Vireo gilvus*)	O,n?	O,n	O,n	O,n	O,n	O,n?	O,n	O	P,n?	-	-	P
FAMILY: EMBERIZIDAE (Wood Warblers, Sparrows, Blackbirds, and Relatives)												
Orange-crowned Warbler (*Vermivora celata*)	P	O,n?	O,n	O,n	O,n	P	O,n	P	O,n?	-	P	P
Nashville Warbler (*Vermivora ruficapilla*)	P	P	P	P	P	P?	O	P?	P	-	-	P
Yellow Warbler (*Dendroica petechia*)	O,n?	O,n	O,n	O,n	O,n	O	O,n	O	O	-	-	P
Yellow-rumped Warbler (*Dendroica coronata*)	O	O	O	O	O	O	O	O	O	O	O	O
Black-throated Gray Warbler (*Dendroica nigrescens*)	P	P	P	P	P	P	P	P	P	-	-	P
Townsend's Warbler (*Dendroica townsendi*)	P	P	P	P	P	P	P	P	P	-	-	P
Hermit Warbler (*Dendroica occidentalis*)	P	P	P	P	P	P	P	P	P	-	-	P
MacGillivray's Warbler (*Oporornis tolmiei*)	P	P	P	P	P	P	O	P	P	-	-	P
Common Yellowthroat (*Geothlypis trichas*)	P	P	P	P	P	O	O	O	P	P	P	-
Wilson's Warbler (*Wilsonia pusilla*)	P	O,n	O,n	P,n	O,n	O	O,n	O	P	-	-	P
Yellow-breasted Chat (*Icteria virens*)	P?	P?	P?	P?	P?	P?	P?	-	P?	-	-	-
Western Tanager (*Piranga ludoviciana*)	P	O	O	P	O	P?	O	P	P	-	P?	P
Black-headed Grosbeak (*Pheucticus melanocephalus*)	P,n	O,n	O,n	O,n	O,n	O,n?	O,n	P	P,n	-	-	P
Lazuli Bunting (*Passerina amoena*)	P	P	P	P	P	P	P	O	P	-	-	-
Rufous-sided Towhee (*Pipilo erythropthalmus*)	O,n	O,n	O,n	P,n	O,n	P,n?	O,n	P	O,n	-	P,n?	P,n?
California Towhee (*Pipilo rubescens*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n

	REACH											Urban Forest
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	Rchs 6-8
Chipping Sparrow (*Spizella passerina*)	P	-	-	-	-	P	P	P	P			
Savannah Sparrow (*Passerculus sandwichensis*)	O	-	-	-	-	P	P	O	O	P	O	-
Fox Sparrow (*Passerella iliaca*)	O	O	O	P	P	O	O	O	O	-	O	P
Song Sparrow (*Melospiza melodia*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O	O,n	-
Lincoln's Sparrow (*Melospiza lincolnii*)	O	O	O	P	P	O	O	O	O	O	O	P
Swamp Sparrow (*Melospiza georgiana*)	P	P	P	P	P	P	P	P	O	-	-	-
White-throated Sparrow (*Zonotrichia albicollis*)	P	P	P	P	P	P	P	P	P	P	P	P
Golden-crowned Sparrow (*Zonotrichia atricapilla*)	O	O	O	O	O	O	O	O	O	O	O	O
White-crowned Sparrow (*Zonotrichia leucophrys*)	O	O	O	O	O	O	O	O	O	O	O	O
Dark-eyed Junco (*Junco hyemalis*)	P	O	O	P	O	P	O	P	P	P	O	P
Red-winged Blackbird (*Agelaius phoeniceus*)	O,n	P	O	P	P	P	P	O,n	O	P	O,n?	-
Western Meadowlark (*Sturnella neglecta*)	O	-	-	-	-	O	-	P	O	P	P	-
Brewer's Blackbird (*Euphagus cyanocephalus*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
Brown-headed Cowbird (*Molothrus ater*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
Hooded Oriole (*Icterus cucullatus*)	P,n	O,n	O,n	P,n	P,n	O,n	P,n	O,n	P	P,n	P,n	P,n
Northern Oriole (*Icterus galbula*)	O,n	O,n	O,n	O,n	O,n	O,n?	O,n	O,n	O,n	P,n?	P,n	O,n
FAMILY: FRINGILLIDAE (Finches)												
Purple Finch (*Carpodacus purpureus*)	P	P	P	P	O	O	O	P	O	P?	P	P
House Finch (*Carpodacus mexicanus*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
Pine Siskin (*Carduelis pinus*)	O	P	P	P	O	P	P	P	O	P	P	P
Lesser Goldfinch (*Carduelis psaltria*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
American Goldfinch (*Carduelis tristis*)	O,n?	O	O	P	O	O	O,n?	O,n?	O	O	O	O
FAMILY: PASSERIDAE (Weaver Finches)												
House Sparrow (*Passer domesticus*)	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n	O,n
CLASS: MAMMALIA												
ORDER: MARSUPIALIA (Opossums, Kangaroos, and Relatives)												
FAMILY: DIDELPHIDAE (Opossums)												
Virginia Opossum (*Didelphis virginiana*)	P	S	P	P	S	P	S	S	P	P	P	P

	REACH											Urban Forest
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	Rchs 6-8
ORDER: INSECTIVORA (Shrews and Moles)												
FAMILY: SORICIDAE (Shrews)												
Trowbridge's Shrew (*Sorex trowbridgii*)	P?	P	P	P	P	P?	P	P?	P	-	-	-
FAMILY: TALPIDAE (Moles)												
Broad-footed Mole (*Scapanus latimanus*)	P	P	S	P	P	P?	P	P?	P	-	-	-
ORDER: CHIROPTERA (Bats)												
FAMILY: VESPERTILIONIDAE (Vespertilionid Bats)												
Yuma Myotis (*Myotis yumanensis*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
Fringed Myotis (*Myotis thysanodes*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
Long-legged Myotis (*Myotis volans*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
Big Brown Bat (*Eptesicus fuscus*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
Red Bat (*Lasiurus borealis*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
Hoary Bat (*Lasiurus cinereus*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
FAMILY: MOLOSSIDAE (Free-tailed Bat)												
Brazilian Free-tailed Bat (*Tadarida brasiliensis*)	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a	P,a
ORDER: LAGOMORPHA (Rabbits, Hares, and Pikas)												
FAMILY: LEPORTIDAE (Rabbits and Hares)												
Brush Rabbit (*Sylvilagus bachmani*)	P	P	P	P	O	P	P	O	O	-	-	-
Audubon's Cottontail (*Sylvilagus audubonii*)	P?	P?	P?	P?	P?	P	P	P?	P	-	-	-
Black-tailed Hare (*Lepus californicus*)	P?	-	-	-	-	-	-	O	O	-	-	-
ORDER: RODENTIA (Squirrels, Rats, Mice, and Relatives)												
FAMILY: SCIURIDAE (Squirrels, Chipmunks, and Marmots)												
California Ground Squirrel (*Spermophilus beecheyi*)	O	-	P	-	O	O	P	O	O	O	O	-

	REACH											Urban Forest Rchs
	A	6	7	8	9	10	11	12	Guad. Crk.	Ross Crk.	Canoas Crk.	6-8
Eastern Gray Squirrel (*Sciurus carolinensis*)	O	O	O	O	O	O	O	O	O	O	O	O
Fox Squirrel (*Sciurus niger*)	O	O	O	O	O	O	O	O	O	O	O	O
FAMILY: GEOMYIDAE (Pocket Gophers)												
Botta's Pocket Gopher (*Thomomys bottae*)	P	O	P	P	P	S	S	P	S	P	P	P
FAMILY: CRICETIDAE (Deer Mice, Voles, and Relatives)												
Western Harvest Mouse (*Reithrodontomys megalotis*)	P	P	P	P	O	O	P	P	P	P	P	P
Deer Mouse (*Peromyscus maniculatus*)	P	P	P	P	O	P	P	P	P	P	P	P
California Vole (*Microtus californicus*)	P	P	P	P	P	P	P	-	P	-	-	-
Muskrat (*Ondatra zibethicus*)	P	O	P	P	P	O	P	O	-	-	-	-
FAMILY: MURIDAE (Old World Rats and Mice)												
Black Rat (*Rattus rattus*)	P	P	P	P	P	P	P	P	P	P	P	P
Norway Rat (*Rattus norvegicus*)	P	O	O	P	P	P	S	P	P	P	P	P
House Mouse (*Mus musculus*)	P	P	O	P	P	O	P	P	P	P	P	P
ORDER: CARNIVORA (Carnivores)												
FAMILY: PROCYONIDAE (Raccoons and Relatives)												
Raccoon (*Procyon lotor*)	S	S	S	S	S	P	S	P	S	P	P	P
FAMILY: MUSTELIDAE (Weasels, Badgers, and Relatives)												
Striped Skunk (*Mephitis mephitis*)	P?	P?	P?	P?	P?	P	P	P	P	-	-	-
FAMILY: FELIDAE (Cats)												
Feral Cat (*Felis domesticus*)	P	O	O	O	O	O	O	O	O	O	O	P
ORDER: ARTIODACTYLA												
FAMILY: CERVIDAE (Deer, Elk, and Relatives)												
Black-tailed Deer (*Odocoileus hemionus*)	-	-	-	-	-	-	-	-	O	-	-	-

APPENDIX W-C

SEASONAL STATUS OF BIRD SPECIES ALONG THE GUADALUPE RIVER PROJECT AREA (REACHES 6-12, A, AND GUADALUPE CREEK, ROSS CREEK, AND CANOAS CREEK)

Appendix W-C. Seasonal Bird Status

Appendix W-C. Seasonal Status of Bird Species Along the Guadalupe River Project Area (Reaches 6-12, A, Guadalupe Creek, Ross Creek and Canoas Creek), San Jose, Santa Clara County

KEY:

R = Year-round resident.
R-c = Species present all year, but status of sub-populations complex; may have resident population, migrant population, wintering population, and summering population, or some combination of these populations.
SR = Summer or breeding season resident.
WR = Winter resident.
M = Spring and/or fall migrant.
VR = Resident in the vicinity of this portion of the creek, but predicted to be only an occasional visitor to the project site.
i = Species present irregularly; may be numerous in some years and in low numbers or absent in others.
***** = Species predicted to visit the study area only rarely.

Notes:

- Refer to Appendix W-B for information of each species' occurence in a given reach. Most species listed as "R", "R-c", and "SR" breed in the study area.
- A question mark indicates the species' status is uncertain.
- Individuals of several species with "SR" and "M" notation may rarely over-winter in this portion of the Guadalupe River corridor.

CLASS: AVES

FAMILY: PODICIPEDIDAE (Grebes)

Pied-billed Grebe (*Podilymbus podiceps*)	WR,M

ORDER: PELECANIFORMES (Tropicbirds, Pelicans, and Relatives)

FAMILY: PHALACROCORACIDAE (Cormorants)

Double-crested Cormorant (*Phalacrocorax auritus*)	WR,M

ORDER: CICONIIFORMES (Herons, Storks, Ibises, and Relatives)

FAMILY: ARDEIDAE (Herons and Bitterns)

American Bittern (*Botaurus lentiginosus*)	M,WR*
Great Blue Heron (*Ardea herodias*)	R-c
Great Egret (*Casmerodius albus*)	R-c

Snowy Egret (*Egretta thula*)	R-c
Green-backed Heron (*Butorides striatus*)	R-c
Black-crowned Night-Heron (*Nycticorax nycticorax*)	R-c
ORDER: ANSERIFORMES (Screamers, Ducks, and Relatives)	
FAMILY: ANATIDAE (Swans, Geese, and Ducks)	
Canada Goose (*Branta canadensis*)	M*
Wood Duck (*Aix sponsa*)	M,WR*
Green-winged Teal (*Anas crecca*)	M*
Mallard (*Anas platyrhynchos*)	R-c
Northern Pintail (*Anas acuta*)	M*
Cinnamon Teal (*Anas cyanoptera*)	M
Northern Shoveler (*Anas clypeata*)	M*
Gadwall (*Anas strepera*)	M
ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)	
FAMILY: CATHARTIDAE (American Vultures)	
Turkey Vulture (*Cathartes aura*)	R-c
FAMILY: ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)	
Osprey (*Pandion haliaetus*)	M*
Black-shouldered Kite (*Elanus caeruleus*)	R-c*
Sharp-shinned Hawk (*Accipiter striatus*)	M,WR
Cooper's Hawk (*Accipiter cooperii*)	M,WR[1]
Red-shouldered Hawk (*Buteo lineatus*)	R-c
Red-tailed Hawk (*Buteo jamaicensis*)	R-c
FAMILY: FALCONIDAE (Caracaras and Falcons)	
American Kestrel (*Falco sparverius*)	R-c
Merlin (*Falco columbarius*)	M,WR
ORDER: GALLIFORMES (Megapodes, Currassows, Pheasants, and Relatives)	
FAMILY: PHASIANIDAE (Quails, Pheasants, and Relatives)	
California Quail (*Callipepla californica*)	R
ORDER: GRUIFORMES (Cranes, Rails, and Relatives)	
FAMILY: RALLIDAE (Rails, Gallinules, and Coots)	
Virginia Rail (*Rallus limicola*)	M*
Common Moorhen (*Gallinula chloropus*)	R-c
American Coot (*Fulica americana*)	M,WR
ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and Relatives)	

FAMILY: CHARADRIIDAE (Plovers and Relatives)	
Killdeer (*Charadrius vociferus*)	R-c
FAMILY: SCOLOPACIDAE (Sandpipers and Relatives)	
Greater Yellowlegs (*Tringa melanoleuca*)	M,WR
Spotted Sandpiper (*Actitis macularia*)	M,WR
Least Sandpiper (*Calidris minutilla*)	M,WR*
Baird's Sandpiper (*Calidris bairdii*)	M*
Pectoral Sandpiper (*Calidris melanotos*)	M*
Long-billed Dowitcher (*Limnodromus scolopaceus*)	M*
Common Snipe (*Gallinago gallinago*)	M,WR
FAMILY: LARIDAE (Gulls and Terns)	
Mew Gull (*Larus canus*)	WR
Ring-billed Gull (*Larus delawarensis*)	WR
California Gull (*Larus californicus*)	R-c
Herring Gull (*Larus argentatus*)	WR
Thayer's Gull (*Larus thayeri*)	WR
Western Gull (*Larus occidentalis*)	WR,M
Glaucous-winged Gull (*Larus glaucescens*)	WR
Caspian Tern (*Sterna caspia*)	SR,M
Forster's Tern (*Sterna forsteri*)	SR,M

ORDER: COLUMBIFORMES (Pigeons and Doves)

FAMILY: COLUMBIDAE (Pigeons and Doves)	
Rock Dove (*Columba livia*)	R
Band-tailed Pigeon (*Columba fasciata*)	R-c
Mourning Dove (*Zenaida macroura*)	R-c

ORDER: STRIGIFORMES (Owls)

FAMILY: TYTONIDAE (Barn Owls)	
Barn Owl (*Tyto alba*)	R-c
FAMILY: STRIGIDAE (Typical Owls)	
Great Horned Owl (*Bubo virginianus*)	R?
Burrowing Owl (*Athene cunicularia*)	VR

ORDER: APODIFORMES (Swifts and Hummingbirds)

FAMILY: APODIDAE (Swifts)	
Black Swift (*Cypseloides niger*)	M*
Vaux's Swift (*Chaetura vauxi*)	M
White-throated Swift (*Aeronautes saxatalis*)	R
FAMILY: TROCHILIDAE (Hummingbirds)	
Black-chinned Hummingbird (*Archilochus alexandri*)	SR?

Anna's Hummingbird (*Calypte anna*)	R-c
Rufous Hummingbird (*Selasphorus rufus*)	M
Allen's Hummingbird (*Selasphorus sasin*)	M,SR
ORDER: CORACIIFORMES (Kingfishers and Relatives)	
FAMILY: ALCEDINIDAE (Kingfishers)	
Belted Kingfisher (*Ceryle alcyon*)	R-c
ORDER: PICIFORMES (Woodpeckers and Relatives)	
FAMILY: PICIDAE (Woodpeckers and Wrynecks)	
Acorn Woodpecker (*Melanerpes formicivorous*)	R
Red-breasted Sapsucker (*Sphyrapicus ruber*)	WR,M
Red-naped Sapsucker (*Sphyrapicus nuchalis*)	M,WR*
Nuttall's Woodpecker (*Picoides nuttallii*)	R-c
Downy Woodpecker (*Picoides pubescens*)	R-c
Hairy Woodpecker (*Picoides villosus*)	M,WR*
Northern Flicker (*Colaptes auratus*)	M,WR
ORDER: PASSERIFORMES (Perching Birds)	
FAMILY: TYRANNIDAE (Tyrant Flycatchers)	
Western Wood-Pewee (*Contopus sordidulus*)	M
Willow Flycatcher (*Empidonax traillii*)	M
Pacific-slope Flycatcher (*Empidonax difficilis*)	M,SR
Black Phoebe (*Sayornis nigricans*)	R-c
Say's Phoebe (*Sayornis saya*)	M,WR
Ash-throated Flycatcher (*Myiarchus cinerascens*)	M*
Western Kingbird (*Tyrannus verticalis*)	M*
FAMILY: HIRUNDINIDAE (Swallows)	
Tree Swallow (*Tachycineta bicolor*)	M
Violet-green Swallow (*Tachycineta thalassina*)	M,SR
Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)	SR,M
Cliff Swallow (*Hirundo pyrrhonota*)	SR,M
Barn Swallow (*Hirundo rustica*)	SR,M
FAMILY: CORVIDAE (Jays, Magpies, and Crows)	
Scrub Jay (*Aphelocoma coerulescens*)	R
American Crow (*Corvus brachyrhynchos*)	R-c
FAMILY: PARIDAE (Titmice)	
Chestnut-backed Chickadee (*Parus rufescens*)	R
Plain Titmouse (*Parus inornatus*)	R
FAMILY: AEGITHALIDAE (Bushtit)	
Bushtit (*Psaltriparus minimus*)	R
FAMILY: SITTIDAE (Nuthatches)	

Red-breasted Nuthatch (*Sitta canadensis*)	M,i
White-breasted Nuthatch (*Sitta carolinensis*)	R
FAMILY: CERTHIIDAE (Creepers)	
Brown Creeper (*Certhia americana*)	M,WR
FAMILY: TROGLODYTIDAE (Wrens)	
Bewick's Wren (*Thryomanes bewickii*)	R
House Wren (*Troglodytes aedon*)	M,WR
Winter Wren (*Troglodytes troglodytes*)	M,WR
Marsh Wren (*Cistothorus palustris*)	M*
FAMILY: MUSCICAPIDAE (Old World Warblers, Gnatcatchers, Kinglets, Thrushes, Bluebirds, and Wrentit)	
Golden-crowned Kinglet (*Regulus satrapa*)	M,WR,i
Ruby-crowned Kinglet (*Regulus calendula*)	M,WR
Blue-gray Gnatcatcher (*Polioptila caerulea*)	M*
Swainson's Thrush (*Catharus ustulatus*)	M
Hermit Thrush (*Catharus guttatus*)	WR,M
American Robin (*Turdus migratorius*)	R-c
Varied Thrush (*Ixoreus naevius*)	WR,M,i
Wrentit (*Chamaea fasciata*)	R
FAMILY: MIMIDAE (Mockingbirds and Thrashers)	
Northern Mockingbird (*Mimus polyglottos*)	R
FAMILY: MOTACILLIDAE (Wagtails and Pipits)	
American Pipit (*Anthus rubescens*)	M,WR
FAMILY: BOMBYCILLIDAE (Waxwings)	
Cedar Waxwing (*Bombycilla cedrorum*)	M,WR
FAMILY: LANIIDAE (Shrikes)	
Loggerhead Shrike (*Lanius ludovicianus*)	R-c
FAMILY: STURNIDAE (*Starlings*)	
European Starling (*Sturnus vulgaris*)	R-c
FAMILY: VIREONIDAE (*Typical Vireos*)	
Solitary Vireo (*Vireo solitarius*)	M*
Hutton's Vireo (*Vireo huttoni*)	R
Warbling Vireo (*Vireo gilvus*)	M,SR
FAMILY: EMBERIZIDAE (Wood Warblers, Sparrows, Blackbirds, and Relatives)	
Orange-crowned Warbler (*Vermivora celata*)	M,SR
Nashville Warbler (*Vermivora ruficapilla*)	M*
Yellow Warbler (*Dendroica petechia*)	M,SR
Yellow-rumped Warbler (*Dendroica coronata*)	M,WR
Black-throated Gray Warbler (*Dendroica nigrescens*)	M*
Townsend's Warbler (*Dendroica townsendi*)	M,WR
Hermit Warbler (*Dendroica occidentalis*)	M*
MacGillivray's Warbler (*Oporornis tolmiei*)	M*
Common Yellowthroat (*Geothlypis trichas*)	M,WR

Wilson's Warbler (*Wilsonia pusilla*)	M,SR
Yellow-breasted Chat (*Icteria virens*)	M*
Western Tanager (*Piranga ludoviciana*)	M
Black-headed Grosbeak (*Pheucticus melanocephalus*)	SR,M
Lazuli Bunting (*Passerina amoena*)	M*
Rufous-sided Towhee (*Pipilo erythropthalmus*)	R
Brown Towhee (*Pipilo rubescens*)	R
Chipping Sparrow (*Spizella passerina*)	M*
Savannah Sparrow (*Passerculus sandwichensis*)	M,WR
Fox Sparrow (*Passerella iliaca*)	M,WR
Song Sparrow (*Melospiza melodia*)	R-c
Lincoln's Sparrow (*Melospiza lincolnii*)	M,WR
Swamp Sparrow (*Melospiza georgiana*)	M,WR*
White-throated Sparrow (*Zonotrichia albicollis*)	M,WR*
Golden-crowned Sparrow (*Zonotrichia atricapilla*)	M,WR
White-crowned Sparrow (*Zonotrichia leucophrys*)	M,WR
Dark-eyed Junco (*Junco hyemalis*)	M,WR
Red-winged Blackbird (*Agelaius phoeniceus*)	R-c
Western Meadowlark (*Sturnella neglecta*)	M,WR
Brewer's Blackbird (*Euphagus cyanocephalus*)	R-c
Brown-headed Cowbird (*Molothrus ater*)	SR,M
Hooded Oriole (*Icterus cucullatus*)	SR,M
Northern Oriole (*Icterus galbula*)	SR,M
FAMILY: FRINGILLIDAE (Finches)	
Purple Finch (*Carpodacus purpureus*)	WR,M*
House Finch (*Carpodacus mexicanus*)	R-c
Pine Siskin (*Carduelis pinus*)	M,WR,i
Lesser Goldfinch (*Carduelis psaltria*)	R-c
American Goldfinch (*Carduelis tristis*)	M,WR
FAMILY: PASSERIDAE (Weaver Finches)	
House Sparrow (*Passer domesticus*)	R

1. A pair of Cooper's Hawks has nested in the Willow Glen district of San Jose, in the vicinity of the study area, in 1989-90, and so might be considered to be present in the area all year, but with a complex seasonal status.

APPENDIX X

REACH SPECIFIC EVALUATION OF VISUAL SENSITIVITY

APPENDIX X

REACH SPECIFIC EVALUATION OF VISUAL SENSITIVITY

The following text describes the specific evaluation of visual sensitivity for the Santa Clara Valley Water District's proposed Upper Guadalupe River Flood Control Project. Areas evaluated include Reach A, reaches 6 through 12 on the main channel, and two tributaries, Ross and Canoas creeks. This information supplements the material contained in Section 4.15, Visual/Aesthetic Resources, of Volume I of this EIR/EIS.

Reach A. Reach A consists of three homogeneous sections based on adjacent land use. The first section (station point 475+00 to 510+00) is predominantly surrounded by parking lots. The second section (station point 510+00 to 525+00) is bisected by busy Airport Parkway and is adjacent to the main entrance to the San Jose International Airport. The last section (station point 525+00 to 581+00) is bordered by SR 87 and the San Jose International Airport.

Station Point 475+00 to 510+00

This section of Reach A is bordered by the San Jose International Airport and parking lots for the airport. The levees of the River are used by joggers on a daily basis. This user group was classified as recreational and thus assigned a rating of high. Visitors to the airport also have views of this section of the River. Visitors were classified as commuters, which equals a rating of low. The view duration of both these user groups is short term, which was assigned a low rating. Because these user groups have not expressed concern about proposed changes to this section of the River, the local values category was assigned a rating of low. The sum of the numerical values assigned to the ratings is 6. Under this classification system, this section of Reach A is not a visually sensitive area.

Station Point 510+00 to 525+00

This section of Reach A is bordered on the east by SR 87, bordered on the west by parking lots for the San Jose International Airport, and bisected at station point 516+00 by Airport Parkway. Adjacent to the Airport Parkway bridge is the main entrance to the San Jose International Airport. The user groups, view duration, and local values for this section are the same as those for the section above, thus receiving the same ratings. The sum of the numerical values assigned to the ratings is 6. Under this classification system, this section of Reach A is not a visually sensitive area.

Station Point 525+00 to 581+00

This section of Reach A is bordered on the east by SR 87 and on the west by the San Jose International Airport. The user groups, view duration, and local values for this section are the same as those for the section above, thus receiving the same ratings. The sum of the numerical values assigned to the ratings is 6. Under this classification system, this section of Reach A is not a visually sensitive area.

Reach 6. Reach 6 is a single homogeneous reach that extends from station point 715+00 to 740+00. Land uses adjacent to the reach are consistent for the entire length of the reach. Reach 6 is bordered on the east by residential development and on the west by SR 87. At station point 740+00, the SPRR crosses the River. Figure 4.15-12 is an aerial preproject view of Reach 6. Motorists on SR 87 and travelers on the SPRR were classified as commuters; this user group category was assigned a rating of low. Some residences that border the River would be removed to construct the proposed bypass channel, which would open up views of the River to many of the remaining residences. The user group of the remaining residences was assigned a rating of high. The view duration category for the commuters was assigned a rating of low, and the view duration for the residents was assigned a rating of high. Because neither user group has expressed public concern regarding proposed actions in this reach of the River, the local values category was assigned a rating of low. The sum of the numerical values assigned to the ratings is 9. Under this classification system, Reach 6 is a visually sensitive area.

Reach 7. Because several land uses are adjacent to Reach 7, the reach was assessed as four homogeneous sections. The first section (station point 740+00 to 745+00) is between the SPRR and SR 87 crossings. The second section (station point 745+00 to 755+00) has commercial development on the east bank and residential development on the west bank. The third section (station point 755+00 to 775+00) is bordered on the east by Lelong Avenue and parking lots, and on the west by commercial development. The fourth section (station point 775+00 to 780+00) is bordered on the east by the Elk's Club and parking lot, and on the west by residential development.

Station Point 740+00 to 745+00

This section of Reach 7 begins at the crossing of the SPRR. SR 87 and the LRT line cross the River at station point 743+00. There is no development between the SPRR and SR 87. Travelers on the SPRR, SR 87, and the LRT system were classified as commuters; this user group category was assigned a rating of low. The view duration for the commuters was assigned a rating of low. The local values category was also rated low because concerns were not expressed about the project proposed for this section of Reach 7. The sum of the numerical values assigned to the ratings is 3. Under this classification system, this section of Reach 7 is not a visually sensitive area.

Station Point 745+00 to 755+00

This section of Reach 7 is bordered on the east by commercial development and on the west by Minnesota Avenue. Willow Street crosses the River at station point 750+00.

Construction for this section of Reach 7 is proposed primarily east of the River. Most of the vegetation in the River would remain, which would screen views of the project from residences west of Minnesota Avenue. These residences were not considered as a user group. The commercial development on the east bank would be relocated to construct the bypass channel; therefore, this development also was not rated as a user group. Motorists along Willow Street were classified as commuters and assigned a rating of low. The view duration for these commuters was classified as low. The local values category was also rated low because concerns were not expressed about the project in this section of Reach 7. The sum of the numerical values assigned to the ratings is 3. Under this classification system, this section of Reach 7 is not a visually sensitive area.

Station Point 755+00 to 775+00

This section of Reach 7 is bordered on the east by Lelong Avenue and LRT station parking. Further east, the elevated SR 87 and the LRT station border the section. Residential development is west of the River. Figure 4.15-14 is an aerial preproject view of Reach 7; Figure 4.15-16 is a preproject view of Reach 7 from the LRT station platform. Construction for this section of Reach 7 is proposed primarily east of the River; however, the project would remove a substantial amount of existing vegetation along the east bank. Backyards of the residences immediately west of the River border directly on the upper bank of the River. Changes to the east bank vegetation and topography would introduce views of the project from these residences. Consequently, this user group was assigned a rating of high. Motorists along Lelong Street and SR 87 and passengers of the LRT system were classified as commuters and assigned a rating of low. View duration for the residences was assigned a value of high; view duration for the commuters was assigned a value of low. The local values category was rated low because no concerns were expressed about the project in the section of Reach 7. The sum of the numerical values assigned to the ratings is 9. Under this classification system, this section of Reach 7 is a visually sensitive area.

Station Point 775+00 to 780+00

This section of Reach 7 is bordered on the east by the Elk's Club and parking lot and on the west by high-density residential development. The UPRR crosses the southern end of this reach. In this section, the Preferred Project would be primarily east of the River beneath the Elk's Club parking lot. Existing riparian vegetation screens views from residences. Minimal vegetation would be removed along this section of Reach 7 and views of the project are screened from residences; therefore, these residences were not assigned a rating as a user group. Elk's Club patrons were classified as commercial and assigned a rating of medium. Travelers on the UPRR were classified as commuters and assigned a rating of low. The view duration for the commercial users and the commuters was classified as low. The local values category was rated low because no concerns were expressed about this section of Reach 7. The sum of the numerical values assigned to the ratings is 5. Under this classification system, this section of Reach 7 is not a visually sensitive area.

Reach 8. Reach 8 is a single homogeneous reach that extends from station point 780+00 to 795+00. Adjacent land uses are consistent for the entire length of the reach. This reach begins at the UPRR crossing and ends at the Willow Glen Way crossing. It is bordered on both sides by residential development. Figure 4.15-19 is a preproject view of Mackey Avenue looking north. Figure 4.15-22 is a view looking north from the existing Willow Glen Way bridge. When residences immediately east of the River are removed to construct the bypass channel, residences on the east side of Mackey Avenue would have an unobstructed view of the bypass channel. This user group was assigned a rating of high. Travelers on the UPRR and motorists on Willow Glen Way and Mackey Avenue were classified as commuters and assigned a rating of low. View duration for the residents was assigned a rating of high; the commuters were assigned a rating of low. Concern was expressed by residents along Mackey Avenue about project impacts; therefore, the local values category was assigned a rating of high. The sum of the numerical values assigned to the ratings is 11. Under this classification system, Reach 8 is a visually sensitive area.

Reach 9. Reach 9 consists of two homogeneous sections based on adjacent land use. The first section (station point 795+00 to 810+00) is bordered on the east by a city well site and residential development, and on the west by residential development. The second section (station point 810+00 to 840+00) is bordered on the east by Almaden Road and on the west by residential development.

Station Point 795+00 to 810+00

This section of Reach 9 begins at the Willow Glen Way crossing. It is bordered on the east side by a city well site and residential development. The west bank is bordered by residential development. Pine Avenue abuts the River on the west side at station point 804+00. Because the well site is primarily barren land, it was not assigned a rating as a user group. The residential development was assigned a rating of high. Motorists on adjacent roads were classified as commuters and assigned a rating of low. View duration for the residential development was assigned a rating of high. The commuters were assigned a low rating for view duration. The local values category was rated low because no concerns were expressed about this section of Reach 9. The sum of the numerical values assigned to the ratings is 9. Under this classification system, this section of Reach 9 is a visually sensitive area.

Station Point 810+00 to 840+00

This section of Reach 9 is bordered immediately on the east by Almaden Road. East of Almaden Road is residential development, with a small commercial development near station point 825+00. The River is bordered on the west by residential development. Malone Road crosses the River at station point 822+00. The reach ends at the Curtner Avenue crossing. The residential development was assigned a user group rating of high; the commercial development was assigned a rating of medium. Motorists on Almaden Road and cross streets were classified as commuters and assigned a rating of low. View duration for the residents was assigned a rating of high, and the commuters were assigned a rating of low. Because concerns were expressed by residents along this section of Reach 9 concerning project impacts, the local values category was assigned a rating of high. The sum of the numerical values assigned to the ratings is 13. Under this classification system, this section of Reach 9 is a visually sensitive area.

Reach 10A. Reach 10A is a single homogeneous reach that extends from station point 840+00 to 855+00. Land uses adjacent to the reach are consistent for the entire length of the reach. Almaden Road and commercial development border the east. Residential development borders the west. The reach begins at the Curtner Avenue crossing and ends at the southbound Almaden Expressway crossing. Figure 4.15-25 is an aerial preproject view of Reach 10A looking south; Figure 4.15-27 is a view from the west bank of the River (behind the residential development looking toward the McDonald's establishment). The residents were assigned a rating of high, and the commercial development was assigned a user group rating of medium. Motorists on the various roads were classified as commuters and assigned a rating of low. The view duration for the residents was assigned a rating of high. The commuters were assigned a rating of low. Because residents expressed concern about project impacts in this reach, the local values category was assigned a rating of high. The sum of the numerical values assigned to the ratings is 14. Under this classification system, Reach 10A is a visually sensitive area.

Reach 10B. Reach 10B consists of two homogeneous sections based on adjacent land use. The first section (station point 855+00 to 870+00) is bordered on both sides by Almaden Expressway. The second section (station point 870+00 to 885+00) is bordered on the east by residential development and on the west by Almaden Expressway.

Station Point 855+00 to 870+00

Southbound Almaden Expressway crosses this section of Reach 10B at station point 855+00 and then continues along its west bank. Northbound Almaden Expressway borders the east bank of the River and then crosses it at station point 870+00. Residential and commercial development is on the east side of northbound Almaden Expressway; however, riparian vegetation and street trees screen views of the project in this section. Residential development is on the west side of the southbound Almaden Expressway; views from this development are also screened by street trees and riparian vegetation. Motorists on Almaden Expressway are the only user group with views of the project. These motorists were classified as commuters and assigned a rating of low. Their view duration was also assigned a rating of low. The local values category was rated low because concerns were not expressed about the project in this section of the reach. The sum of the numerical values assigned to the ratings is 3. Under this classification system, this section of Reach 10B is not a visually sensitive area.

Station Point 870+00 to 885+00

This section of Reach 10B is bordered on the east by residential development. Joggers and children use the east levee for exercise and recreation. Northbound and southbound Almaden Expressway with a wide landscaped island in the middle of the lanes, borders the west side of the River in this section. Because development west of Almaden Expressway has obstructed views of the River, the development was not considered a user group. The residents on the east side were assigned a rating of high. The joggers and children were classified as recreational and also assigned a rating of high. Motorists on Almaden Expressway were classified as commuters and assigned a rating of low. View duration for the residents was assigned a rating of high. View duration for the recreational and commuter user groups was classified as low. The local values category was rated low because no concerns were expressed about this section of Reach 10B. The sum of the numerical values assigned to the ratings is 12. Under this classification system, this section of Reach 10B is a visually sensitive area.

Reach 10C. Reach 10C is a homogeneous reach that extends from station point 855+00 to 910+00. The land uses adjacent to the reach are consistent for the entire length of the reach.

Station Point 855+00 to 910+00

Reach 10C is bordered on the east side by an orchard, a packing plant, and a parking lot. The west side is bordered by Old Almaden Road and commercial development. Joggers use the east levee for exercise. Hillsdale Avenue crosses the River near station point 906+00 and Capitol Expressway crosses the River at station point 910+00. The joggers were classified as recreational and assigned a rating of high. The orchard was not considered as a user group because of the limited number of viewers. The packing plant, parking lot, and commercial development were classified as commercial and assigned a rating of medium. Motorists on all roads were classified as commuters and assigned a rating of low. View duration for all user groups was assigned a rating of low. The local values category was rated low because no concerns were expressed about the project in Reach 10C. The sum of the numerical values assigned to the ratings is 8. Under this classification system, Reach 10C is not a visually sensitive area.

Reach 11A. Reach 11A consists of two homogeneous sections based on adjacent land use. The first section (station point 910+00 to 925+00) is bordered on the east by commercial and residential development, and on the west by commercial development. The second section (station point 925+00 to 935+00) is bordered on the east by residential development and on the west by Almaden Expressway.

Station Point 910+00 to 925+00

Capitol Expressway crosses the River at the beginning of this section of Reach 11A. It is bordered on the east by commercial and residential development. Chard Drive and commercial development border the east. Residents were assigned a user group rating of high. The commercial development was assigned a rating of medium. Motorists on adjacent roads were classified as commuters and assigned a rating of low. View duration for the residents was assigned a rating of high. The commercial and commuter user groups were assigned a view duration of low. Because residents along this section of Reach 11A expressed concern about project impacts, the local values category was assigned a rating of high. The sum of the numerical values assigned to the ratings is 13. Under this classification system, this section of Reach 11A is a visually sensitive area.

Station Point 925+00 to 935+00

This section of Reach 11A is bordered on the east side by residential development and on the west side by Almaden Expressway. The residential development west of Almaden Expressway has obstructed views of the River because a dense row of street trees lines the west side of Almaden Expressway. Pedestrians use the east levee for exercise. Figure 4.15-30 is a view of the river corridor from Almaden Expressway looking east. The residents along the east bank were assigned a rating of high. The pedestrians were classified as recreational and assigned a rating of high. Motorists on Almaden Expressway were classified as commuters and assigned a rating of low. View duration for the residents was assigned a rating of high. The recreational and commuter user groups were assigned a view duration of low. Because residents along this section of Reach 11A expressed concern about project impacts, the local values category was assigned a rating of high. The sum of the numerical values assigned to the ratings is 14. Under this classification system, this section of Reach 11A is a visually sensitive area.

Reach 11B. Reach 11B is a single homogeneous reach that extends from station point 935+00 to 950+00. The land uses adjacent to the reach are consistent for the entire length of the reach. Reach 11B is bordered on the east by residential development and a public park. Pedestrians use the east levee for exercise. The pedestrians were classified as recreational and assigned a rating of high. Almaden Expressway and a small pocket of commercial development border the west. Because the commercial development on the west bank would be relocated to construct the project, it was not rated as a user group. The residents along the east bank were assigned a rating of high. Motorists on Almaden Expressway were classified as commuters and assigned a rating of low. View duration for the residents was assigned a rating of high. The recreational and commuter user groups were assigned a view duration of low. Because residents along Reach 11B expressed concern about project impacts, the local values category was assigned a rating of high. The sum of the numerical values assigned to the ratings is 14. Under this classification system, Reach 11B is a visually sensitive area.

Reach 11C. Reach 11C is a single homogeneous reach that extends from station point 950+00 to 960+00. Land uses adjacent to the reach are consistent for the entire length of the reach. Reach 11C is bordered on the east bank by residential development and on the west bank by commercial development and Almaden Expressway. Branham Lane crosses the River at station point 960+00. Pedestrians use the east levee for exercise. Residents along the east bank were assigned a rating of high. The pedestrians were classified as recreational and also assigned a rating of high. The commercial development on the west bank was assigned a rating of medium. Motorists on Almaden Expressway and Branham Lane were classified as commuters and assigned a rating of low. View duration for the residents was assigned a rating of high. The recreational, commercial, and commuter user groups were assigned a view duration of low. Because residents along Reach 11C have expressed concerns about project impacts, the local values category was assigned a rating of high. The sum of the numerical values assigned to the ratings is 16. Under this classification system, Reach 11C is a visually sensitive area.

Reach 12. Reach 12 consists of two homogeneous sections based on adjacent land use. The first section (station point 960+00 to 985+00) is bordered on the east by residential and commercial development and on the west by commercial development and agricultural land. The second section (station point 985+00 to 1016+00) is bordered on the east by a percolation pond and commercial development, and on the west by percolation ponds, agricultural land, and commercial development.

Station Point 960+00 to 985+00

This section of Reach 12 is bordered on the east by residential and commercial development. It is bordered on the west by commercial development and agricultural land. Branham Lane crosses the River at station point 960+00. Pedestrians use the east levee for exercise. Residents along the east bank were assigned a rating of high. Pedestrians were classified as recreational and assigned a rating of high. The commercial developments on both banks were assigned a rating of medium. Motorists on Branham Lane were classified as commuters and assigned a rating of low. The agricultural land was not classified as a user group because of the limited amount of viewers. View duration for the residents was assigned a rating of high. The recreational, commercial, and commuter user groups were assigned a view duration of low. The local values category was rated low because no concerns were expressed about project impacts in this section of Reach 12. The sum of the numerical values assigned to the ratings is 13. Under this classification system, this section of Reach 12 is a visually sensitive area.

Station Point 985+00 to 1016+00

This section of Reach 12 is bordered on the east by a percolation pond and commercial development. It is bordered on the west by agricultural land, two percolation ponds, and a small pocket of commercial development. SR 85 crosses the River at station point 997+00, and Blossom Hill Road crosses the River at station point 1016+00. Pedestrians use the east levee for exercise. Pedestrians were classified as recreational and assigned a rating of high. The commercial developments on both banks were assigned a rating of medium. Motorists on SR 85 and Blossom Hill Road were classified as commuters and assigned a rating of low. The agricultural land and percolation ponds were not classified as a user group because of limited numbers of viewers. All user groups were assigned a view duration of low. Because no concerns about this section of Reach 12 have been expressed, the local values category was rated low. The sum of the numerical values assigned to the ratings is 8. Under this classification system, this section of Reach 12 is not a visually sensitive area.

Ross Creek. The section of Ross Creek in the project area extends from Almaden Expressway to 700 feet upstream of Jarvis Avenue. Ross Creek is bordered on both sides by residential development. At its intersection with the Guadalupe River, it is crossed by Almaden Expressway and Briarglen Drive. Midway through the project section, it is crossed by Cherry Avenue. It is also crossed by Jarvis Avenue near the end of the project section. Because residents along Ross Creek have tall wood fences that block views of the creek, they were not rated as a user group. Motorists on all roads were classified as commuters and assigned a rating of low. View duration for commuters was assigned a rating of low. The local values category was also rated low because no concerns were expressed about the project along Ross Creek. The sum of the numerical values assigned to the ratings is 3. Under this classification system, Ross Creek is not a visually sensitive area.

Canoas Creek. The section of Canoas Creek in the project area extends from Almaden Expressway to Nightingale Drive. Both sides of the creek are bordered by residential development. Because residents along Canoas Creek have tall wood fences that block views of the creek, they were not rated as a user group. Motorists on both roads were classified as commuters and assigned a rating of low. View duration for the commuters was assigned a rating of low. The local values category was rated high because residents expressed concern about the height of floodwalls along Canoas Creek. The sum of the numerical values assigned to the ratings is 3. Under this classification system, Canoas Creek is not a visually sensitive area.